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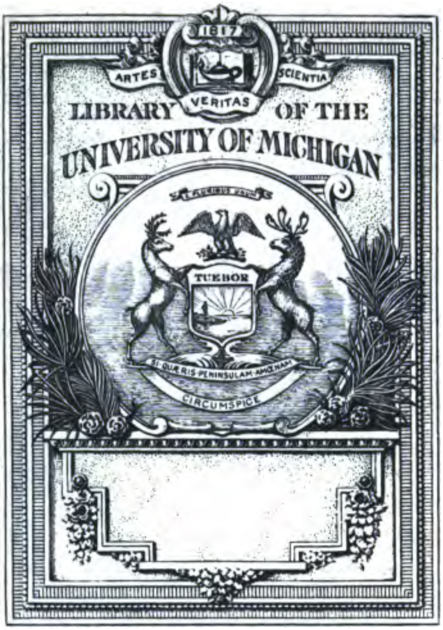

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John Lear
1815

A
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ON
LAND-SURVEYING,

IN SIX PARTS.

Part I. Contains Definitions and Problems in Geometry.

Part II. Rules for finding the Content of Land without uſing a Chain, but by ſtepping the dimenſions, by which any Huſbandman who knows the firſt five Rules of Arithmetic may find the Content of his own work.

Part III. To ſurvey with the Chain and Croſs.

Part IV. To ſurvey with the Chain only.

Part V. Rules for parting off any given portion of a Field, in form of a Triangle, Square or Parallelogram.

Part VI. A full explanation of the method uſed by the moſt eminent Surveyors, in meaſuring and planning a Farm or a Lordſhip, with a Chain only. Illuſtrated with Five Copper-Plates, and an engraved Fac-ſimile of a Field-Book. The Plates exhibit the progreſſive ſteps of planning a ſmall Farm, and point out the appearances of the Plan in ſix different Stages.

By THOMAS DIX, of OUNDLE.

THE WHOLE ILLUSTRATED WITH

ONE HUNDRED AND EIGHTY DIAGRAMS,
AND TEN COPPER-PLATES.

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1799.

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The Company of Grocers, London,

THIS TREATISE

ON LAND-SURVEYING,

COMPOSED

FOR THE USE OF THE PUPILS BELONGING TO THE SCHOOL

UNDER THEIR PATRONAGE IN OUNDLE,

IS HUMBLY DEDICATED,

BY THEIR MOST OBEDIENT,

AND DEVOTED SERVANT,

THOMAS DIX,

ASSISTANT AT THE SAID SCHOOL.

Hist. of Science
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IN the following Treatiſe, the Author does not pretend to any new Diſcovery, or to convey Inſtruction to the experienced Land-Surveyor: his only aim is to ſupply the deficiency of a Book, proper to be introduced into Schools, to inſtruct Boys in the firſt rudiments of Land-ſurveying by the Chain and Croſs only; and as he wiſhes to render it as uſeful as poſſible to young perſons, he will thankfully receive any information, from perſons converſant in ſubjects of this nature, to render a Second Edition more complete.

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LIST OF PLATES.

Plate . . . Page
1 91
2 98
3 107
4 108
5 183
6 186
7 190
8 } . . . . } 193
9 } . . . . }
10 The engraved Fac-ſimile of a Field-Book to be ſtitched by itſelf.

ERRATA.

Page 3, Laſt line but one, for *which* read *and.*
. . . 48, Laſt line but two, for *lines* read *line.*
. . . 68, Laſt line, for *chain-lines* read *line.*
. . . 75, Laſt line but two, for *divide into* read *divide it into.*
. . . 84, Inſtead of 4600 in the 7th line from bottom, and 5800 the 4th line from the bottom, read (10400,) which is the ſum of the former two numbers.
. . . 105, The line *BC* in the ſecond Diagram, ſhould be numbered 875 inſtead of 900.
. . . 119, Second line, for 15 *Perches* read 16 *Perches.*
. . . 121, Third line, a *comma* ſhould follow *long* inſtead of *links.*
. . . 123, At the bottom of the Diagram, for 00 read (500.)
. . . 126, Second line, for 20 read (200.)
. . 128, Tenth line, for 406=*AE* read 404=*AE.*

CONTENTS.

PAGE.

Definitions in Geometry 1

Problems in Geometry 14

PROB.

I. *To divide a given line into two equal Parts* . 14

II. *To erect a Perpendicular from a given Point in a given right Line* 15

Another method, when the point is at the end of the Line, or near the end 16

III. *To let fall a Perpendicular from a given Point on a given right line* 17

Another method when the point is nearly oppoſite the end of the line 18

Another Method 19

IV. *To divide a given Angle into two equal parts* 19

V. *To divide a right Angle into three equal parts* 20

VI. *To make an Angle equal to a given Angle* ... 21

VII. *To divide a given Line into any number of equal parts* 22

VIII. *To draw a line parallel to a given Line which ſhall paſs through a given point* 22

IX. *To draw a line parallel to a given line at a given diſtance* 23

X. *Upon a given right line to make an equilateral Triangle* 24

XI. *To make a Triangle whoſe three ſides ſhall be equal to three given ſtraight lines, if any two of the ſtraight lines are greater than the third* 25

PROB. PAGE.

XII. *To divide a Triangle into two equal parts.* 26

XIII. *To deſcribe a Square upon a given line.* 27

XIV. *To deſcribe a Rectangle, whoſe length and breadth ſhall be equal to two given lines.* 28

XV. *To find the centre of a given Circle.* ... 29

XVI. *Through three given points to deſcribe the circumference of a Circle.* 30

XVII. *To draw a Tangent to a given Circle that ſhall paſs through a given point in the Circle.* 31

CASE II. *When the given point is without the Circle.* 32

XVIII. *To inſcribe a Circle in a given Triangle* 32

XIX. *To inſcribe an Equilateral Triangle in a given Circle.* 33

XX. *To inſcribe a Square in a given Circle.* . 34

XXI. *To inſcribe a Pentagon in a given Circle.* . 34

XXII. *To inſcribe an Hexagon in a given Circle* 35

XXIII. *To inſcribe an Heptagon in a given Circle.* 36

XXIV. *To inſcribe an Octagon in a given Circle.* . 36

XXV. *To inſcribe a Nonagon in a given Circle.* 37

XXVI. *To inſcribe a Decagon in a given Circle.* 38

XXVII. *To inſcribe any regular Polygon in a given Circle.* 39

XXVIII. *To deſcribe a Circle about a given Triangle.* 40

XXIX. *To deſcribe a Circle about a given Square.* 41

XXX. *To deſcribe a Square about a given Circle.* 42

XXXI. *To deſcribe any regular Polygon about a Circle.* 43

XXXII. *To make a regular Pentagon on a given line.* 43

XXXIII. *To make a regular Hexagon on a given line.* 44

PROB. PAGE.
XXXIV. *To draw an Heptagon, whoſe ſides ſhall be equal to a given Line.....* 45
XXXV. *On a given Line to deſcribe an Octagon* 46
XXXVI. *To make a Triangle equal to a given Trapezium.....................* 47
XXXVII. *To make an Angle of any propoſed number of Degrees...............* 48
XXXVIII. *To find the number of degrees in an Angle.........................* 49
XXXIX. *To draw an Oval to two given Diameters.* 50

PART II.

To meaſure Land and find the Contents without plotting or uſing a Chain.................... 51
To ſurvey and find the Content of a Triangular Field. 54
.... a Field with four ſides. 56
.... five ſides. 58
.... ſix ſides. 60
.... Triangular Fields with offsets. 63
.... a four-ſided Field with offsets. 66
.... long narrow Fields. 68

PART III.

To ſurvey with a Chain and Croſs.............. 73
To ſurvey and find the Content of a Triangular Field. 73
.... a Field with four ſides. 76
.... five ſides. 77
.... ſeven ſides. 79
Directions concerning Offsets................. 83
Directions for plotting....................... 90

PART IV.

To ſurvey with the Chain only................ 99
To ſurvey and plot a Triangular Field........ 99

PAGE.
To ſurvey and plot a Field with four ſides. 103
.... *five ſides.* 104
.... *ſix ſides.* 105
.... *eight sides.* 107

PART V.

Rules for parting off given portions of Fields, in form of a Parallelogram or Triangle............. 109
When the fences are at Right Angles........... 109
When the fences are not at right Angles........ 115
When there are Offsets on the given Line........ 118
When the given line is straight, but there are Offsets on an adjoining line....................... 127
When there are Offsets on the given line, and on an adjoining line, or on two adjoining lines...... 135
In form of a Square.......................... 149

PART VI.

Another method of Surveying by the Chain.

To Survey a Triangular Field................. 151
.... *a Field with four ſides*............... 154
.... *five ſides*................ 156
.... *ſix ſides*................. 160
.... *nine ſides*................ 162
Directions concerning Offsets................. 164
The method commonly used by professed Surveyors to find the Area of Land....................... 167
To Survey two adjoining Fields together........ 174
Promiſcuous Directions....................... 179
To Survey four adjoining Fields together........ 183
Directions for Surveying and Planning a ſmall Farm. 186

An Engraved Fac-ſimile of a Field-Book ſtitched by itſelf.

PART THE FIRST.

PRACTICAL GEOMETRY.

DEFINITIONS.

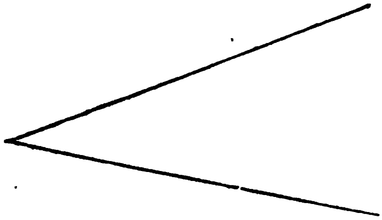
1. A POINT is the beginning of magnitude, and has neither length, breadth nor thickneſs.

2. A Line is length without breadth.

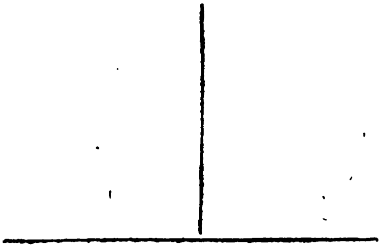
3. A Straight Line is the ſhorteſt which can be drawn from one point to another.

4. Parallel Straight Lines are equally diſtant in all their parts, and if produced ever ſo far both ways would never meet.

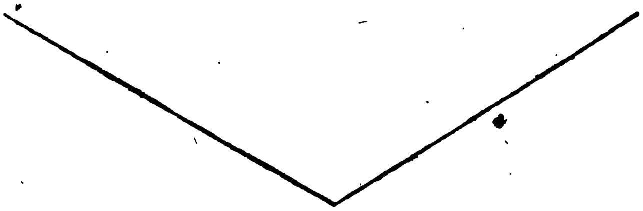
5. An Angle is the meeting of two lines in a point, but not ſo as to form one straight line.



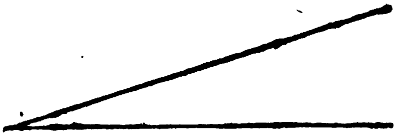
6. When one Straight Line ſtands on another and makes the angles on each ſide equal, both angles are right angles, and that line which ſtands on the other is a perpendicular to it.



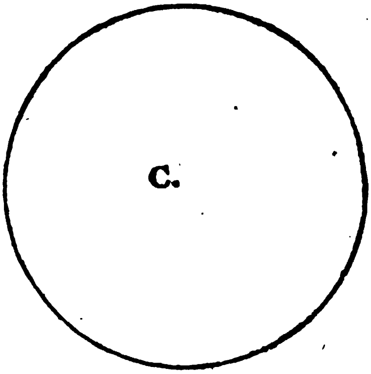
7. An Obtuſe Angle is greater than a right angle.



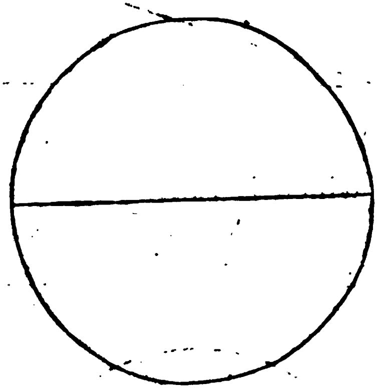
8. An Acute Angle is ſmaller than a right angle.



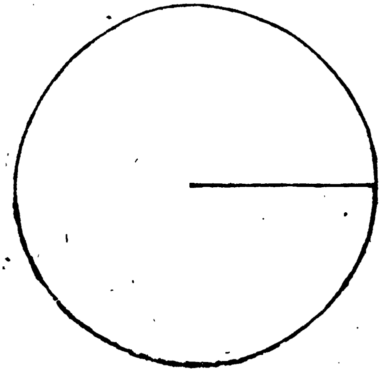
9. A Circle is a plain figure, bounded by one curved line which is called the circumference, which is every where equally diſtant from the point C within the circle, called the centre thereof.



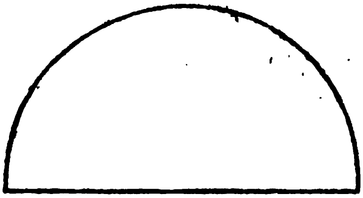
10. A Diameter of a Circle is a ſtraight line drawn through the centre, and terminated both ways by the circumference.



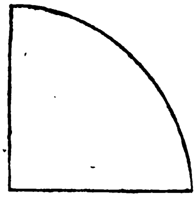
11. A Radius of a Circle is a ſtraight line drawn from the centre to the circumference, and is equal to half the diameter.



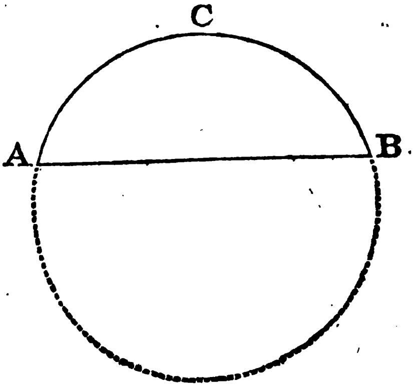
12. A Semicircle is half a circle, and is contained by half the circumference and a diameter.



13. A Quadrant is a quarter of a circle, and is contained by two radii and a quarter of the circumference.



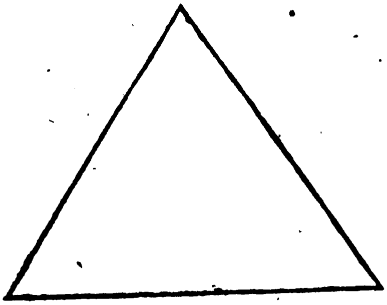
14. A Segment of a Circle is any part of it cut off by a ſtraight line, as A B C.



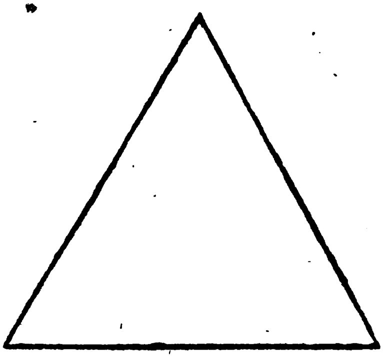
15. A Straight Line cutting off any portion of a circle, greater or leſs than a ſemicircle, and bounded by the circumference is called a Chord, as A B.—*(Laſt Figure.)*

16. And the part of the circumference which is cut off by it is called an Arc, as A B C.—*(Laſt Figure.)*

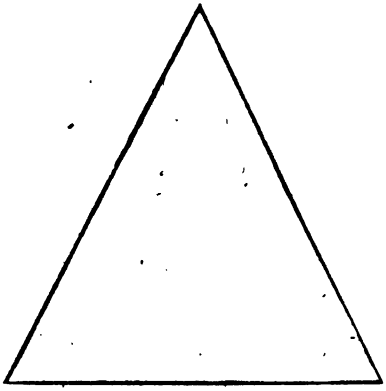
17. All figures contained by three ſtraight lines are called Triangles.



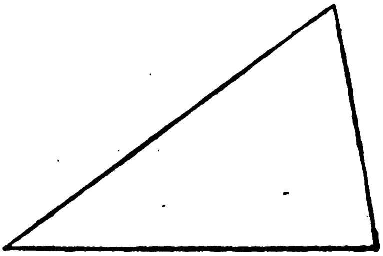
18. An Equilateral Triangle has all its ſides equal.



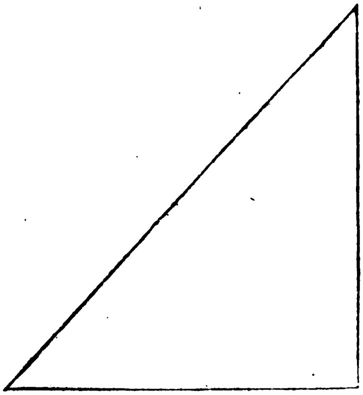
19. An Iſoſceles Triangle has two of its ſides equal.



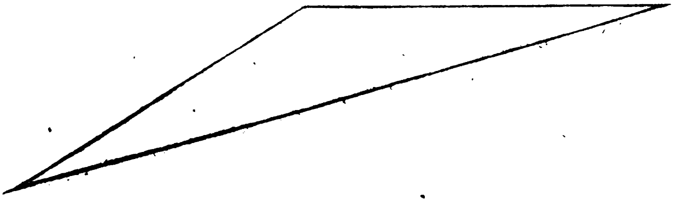
20. A Scalene Triangle has all its ſides unequal.



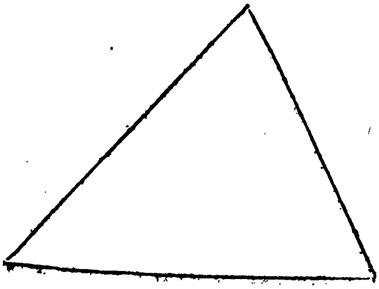
21. A Right Angled Triangle has one right angle.



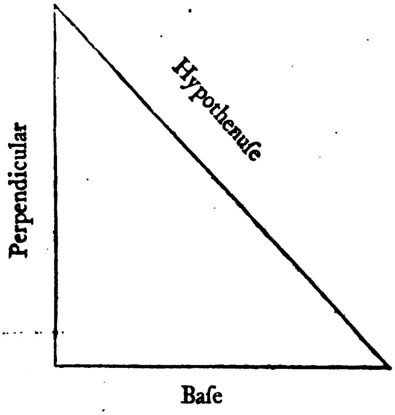
22. An Obtuſe Angled Triangle has one obtuſe angle.



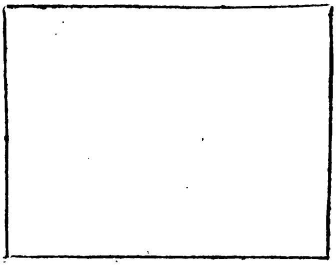
23. An Acute Angled Triangle has three acute angles.



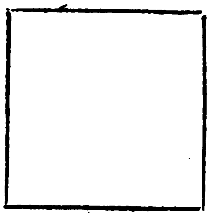
24. An Hypothenuſe is the longeſt ſide of a right angled triangle, the bottom ſide is the Baſe, and the other ſide the Perpendicular.



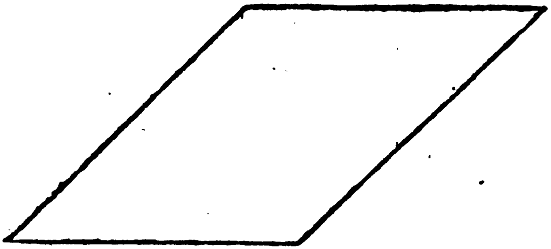
25. All figures contained by four ſtraight lines are called Quadrangles or Quadrilaterals.



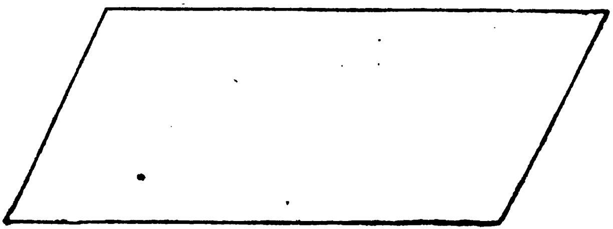
26. A Square has all its ſides equal, and its angles right angles.



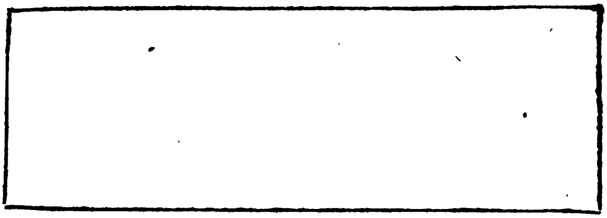
27. A Rhombus has all its ſides equal, but its angles not right angles.



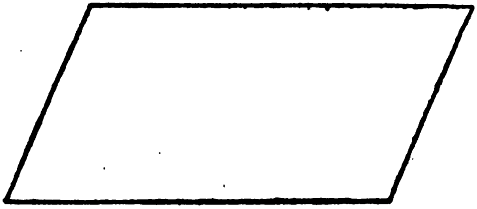
28. A Parallelogram has its oppoſite ſides parallel.



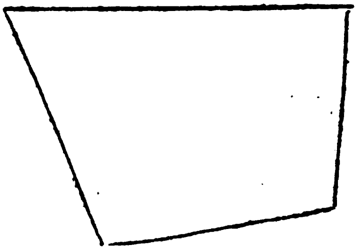
29. A Rectangle is a Parallelogram whoſe angles are all right angles.



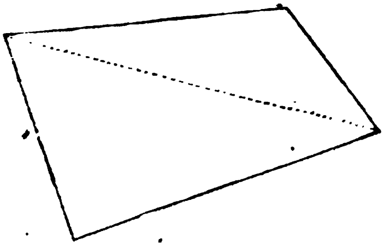
30. A Rhomboid is a Parallelogram whoſe angles are not right angles.



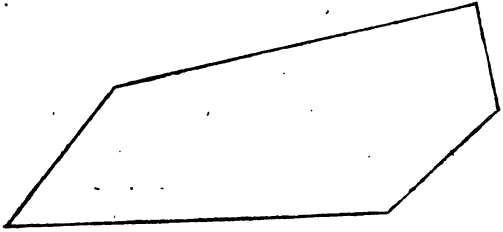
31. All other four ſided figures are called Trapeziums.



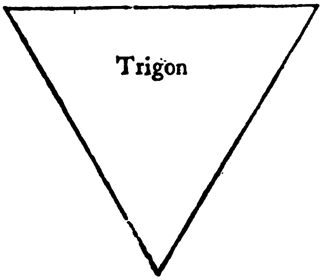
32. A Line drawn from one angle of a figure to another is called the Diagonal.

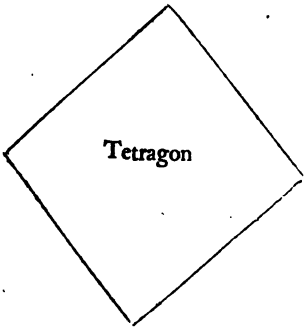


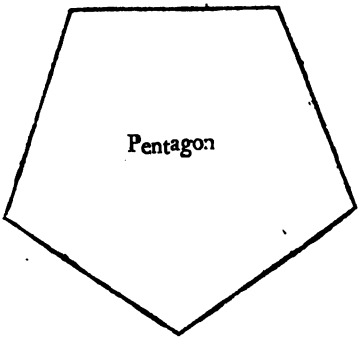
33. All figures contained by more than four ſides are called Polygons.

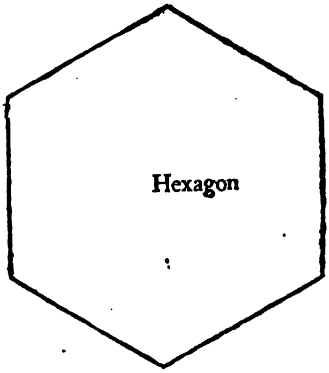


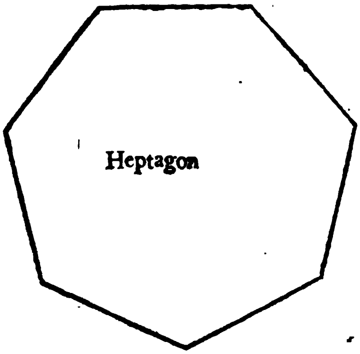
34. All Regular Polygons are named according to the number of lines they are contained by:—

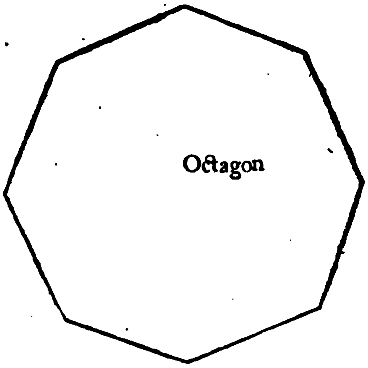


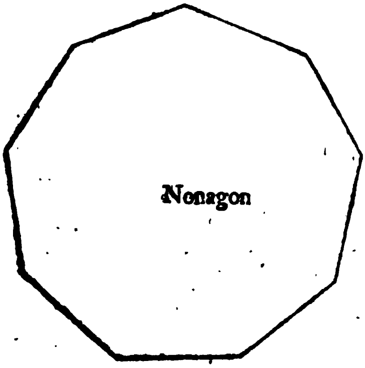


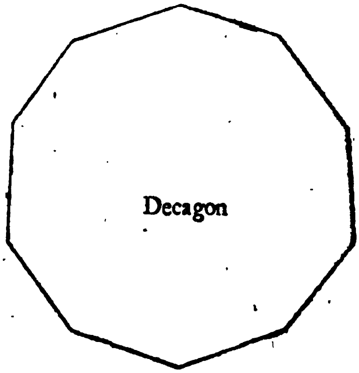

Pentagon


Hexagon


Heptagon


Octagon

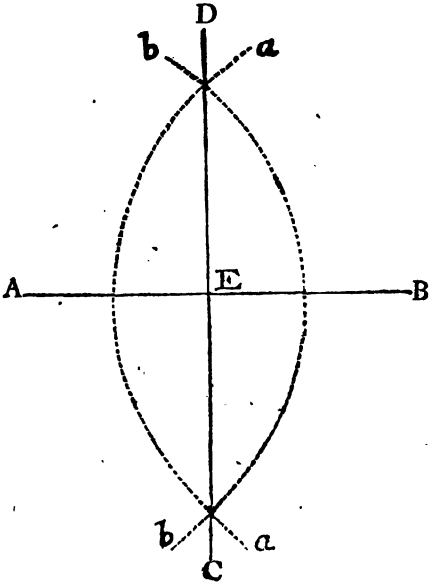

Nonagon


Decagon

PROBLEMS.

PROBLEM I.

To *divide a given line* A B *into two equal parts.*



On the centre B with any radius greater than half the line, deſcribe the arc *a a.*

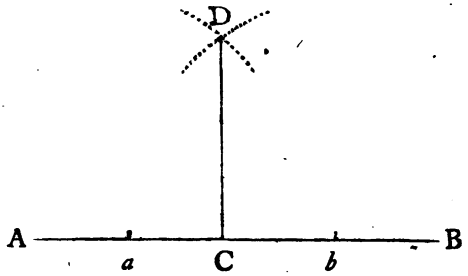
With the ſame radius, and A as a centre, deſcribe the arc *b b.*

Through the points of interſection draw the line C D, which will divide the given line into two equal parts.

N. B. E D is a perpendicular raiſed in the middle of the line A B.

PROBLEM II.

To erect a perpendicular from a given point C *in a given right line* A B.



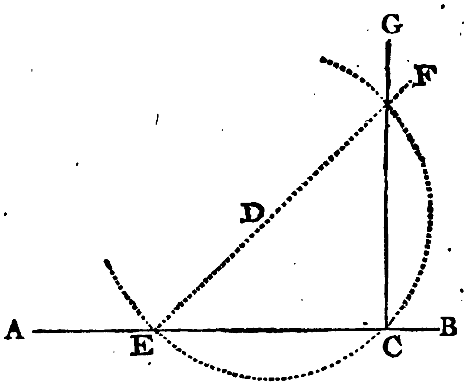
When the given point is near the middle of the line, ſet off two equal diſtances from it on the line A B, as C *a* and C *b*.

With any radius greater than *a* C, and *a* as a centre, deſcribe an arc.

With the ſame radius, and *b* as a centre, deſcribe another arc cutting the former in D.

Draw the line C D, which will be the perpendicular required

When the point is at the end of the line or near the end.

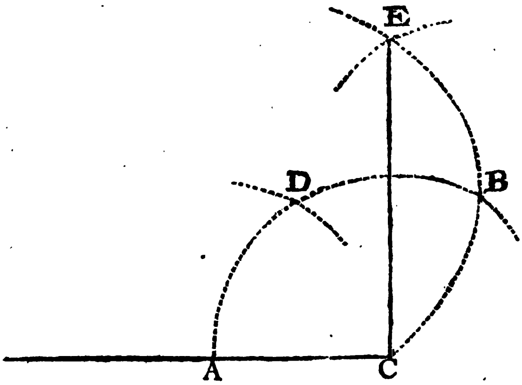


Take any point as D for a centre, and with the radius D C, deſcribe an arc cutting A B in E and C.

Draw the line E F through the point D, cutting the arc in F.

Through the interſection F draw the line C G, which will be the perpendicular required.

ANOTHER METHOD.



With the given point C for a centre, and any convenient radius, deſcribe the arc A B.

With the ſame radius, and A for a centre, croſs the arc in D.

With the ſame radius, and D for a centre, deſcribe the arc E B C cutting the arc A D B in B.

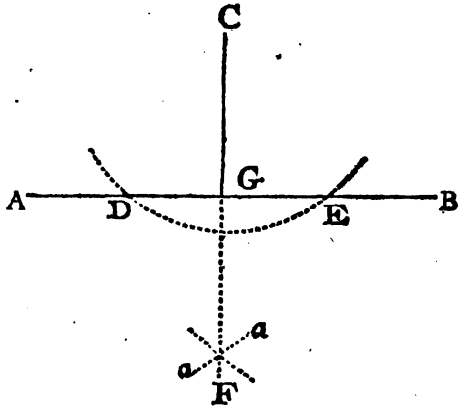
With the ſame radius, and B for a centre, croſs the laſt arc in E.

Draw the line E C, which will be the perpendicular required.

PROBLEM III.

To let fall a perpendicular from a given point C, *on a given right line* AB.

When the point is nearly oppoſite the middle of the line.



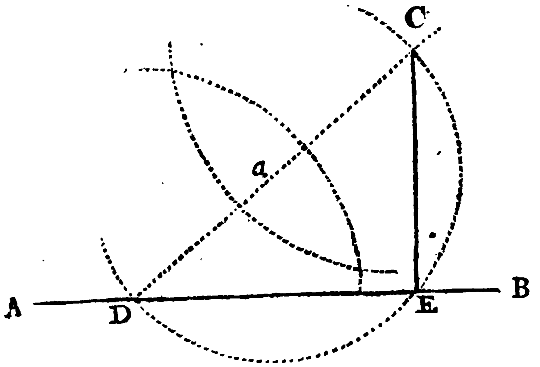
With C as a centre, deſcribe an arc cutting the given line in two places, D and E.

With D as a centre, and a radius longer than D G, deſcribe the arc *a a*.

With the ſame radius, and E as a centre, deſcribe an arc cutting the firſt in F.

Draw the line C F—C G is the perpendicular required.

When the point is nearly oppoſite the end of the line.



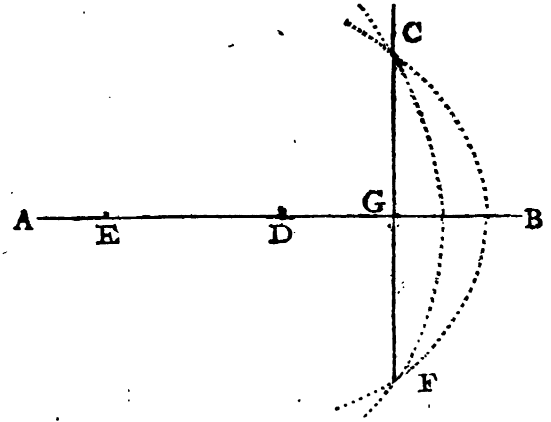
From the point C, draw a line touching the given line in D.

Biſect C D in *a*.

With the radius *a* C, and *a* as a centre, deſcribe the arc C E D.

Draw the line C E, which will be the perpendicular required.

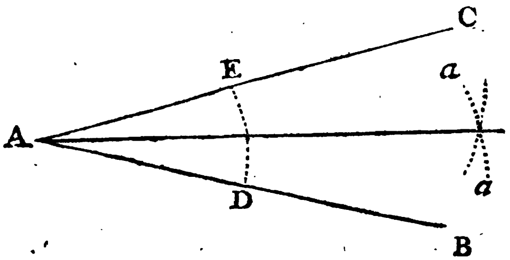
ANOTHER METHOD.



Take two points D and E, in the given line.
On D, with the radius D C, deſcribe an arc.
On E, with the radius E C, deſcribe another.
Through the points of interſection C and F draw a line, C G will be the perpendicular required.

PROBLEM IV.

To divide a given angle B A C *into two equal parts.*



On the centre A, deſcribe the arc D E.

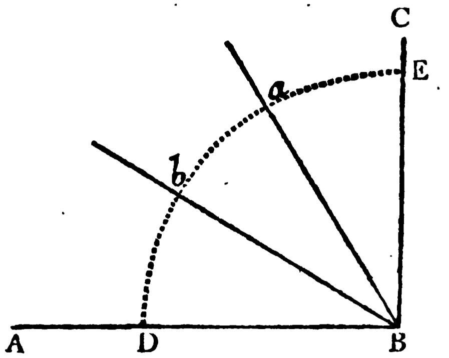
On the centre D, with any radius longer than half of D E, deſcribe the arc *a a*.

On the centre E, with the ſame radius, deſcribe another arc cutting the former in G.

Draw the line A G, which will divide the angle B A C into two equal parts.

PROBLEM V.

To divide a right angle A B C, *into three equal parts.*



With B for a centre, deſcribe an arc D E.

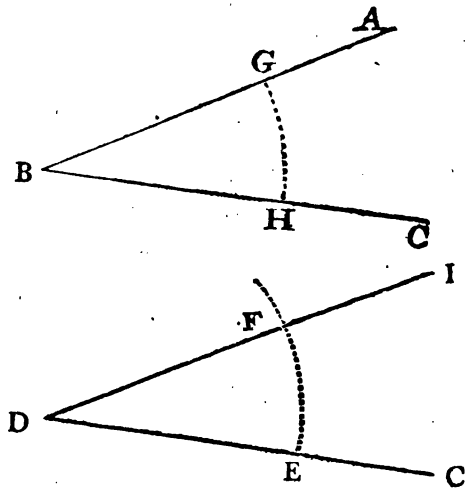
With the ſame radius, and E for a centre, croſs the arc in *b*.

With the ſame radius, and D for a centre, croſs the arc in *a*.

Draw the lines *a* B and *b* B, and the angle will be divided into three equal parts.

PROBLEM VI.

To make an angle equal to a given angle ABC.



Draw the line C D.

With D for a centre, draw the arc E F.

With the ſame radius, and B for a centre, draw the arc G H.

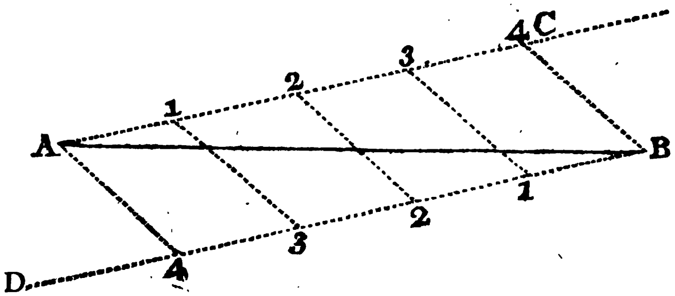
With the compaſſes, take the diſtance G H.

Set the ſame diſtance off from E to F.

Through F, draw the line DI, and you will have the angle required.

PROBLEM VII.

To divide a given line AB *into any number of equal parts.*



Draw the line A C.

Make an angle at B, equal to that at A.

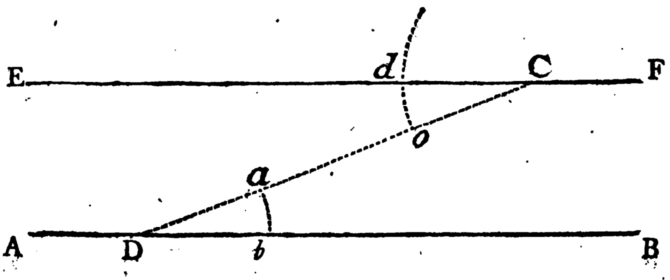
With any convenient diſtance, ſet off the number of parts required (ſuppoſe 4,) from A towards C.

With the ſame diſtance, ſet off the number of parts from B towards D.

Draw the lines (A. 4) 1. 3) 2. 2) &c., which will divide the line A B as was required.

PROBLEM VIII.

To draw a line parallel to a given line AB, *which ſhall paſs through a given point* C.



Take any point D, in the line A B, and draw the line D C.

With D for a centre, deſcribe an arc *a b*.

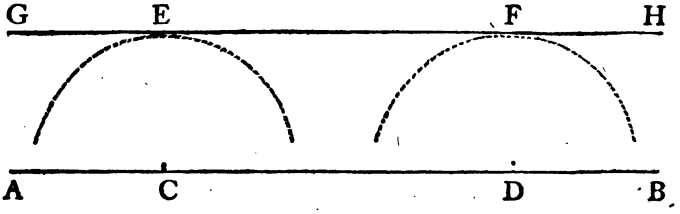
With C for a centre, and the ſame radius, deſcribe the arc *o d*.

Take the diſtance *a b*, and ſet it off from *o*, to the point *d*.

Through the points C *d*, draw the line E F, which will be parallel to A B.

PROBLEM IX.

To draw a line parallel to a given line, at a given diſtance.



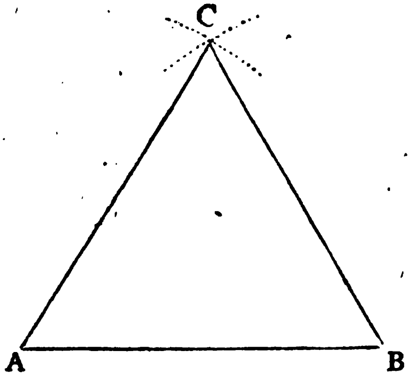
Take two points C and D, in the given line.

Take the given diſtance for a radius, and with C and D as centres, deſcribe the arcs E and F.

Draw the line G H, touching both arcs without cutting them, which will be parallel to A B.

PROBLEM X.

Upon a given right line A B, *to make an equilateral Triangle.*



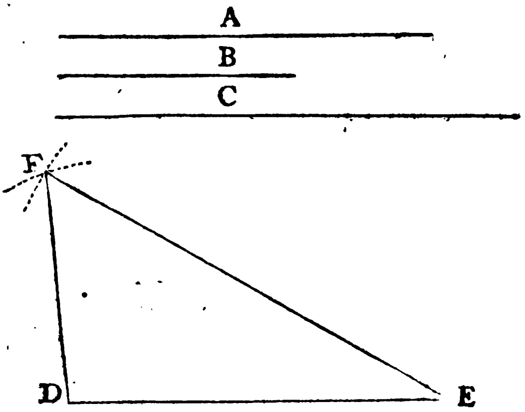
With the radius A B, and A as a centre, deſcribe an arc.

With the ſame radius, and B as a centre, croſs the firſt arc in C.

Draw the lines C A and C B, which will complete the triangle A B C,

PROBLEM XI.

To make a Triangle whoſe three ſides ſhall be equal to three given ſtraight lines, if any two of the given lines are greater than the third. Let A, B, C *be the three given lines.*



Draw the line D E, equal to A.

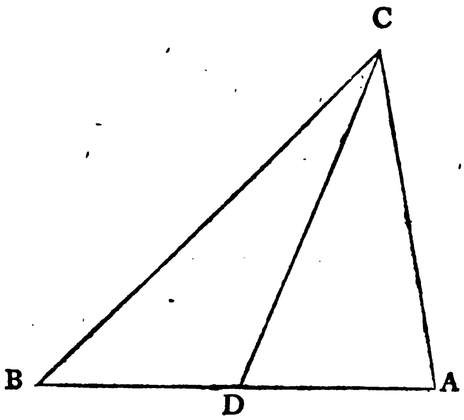
With a radius equal to B, and D as a centre, deſcribe an arc.

With a radius equal to C, and E as a centre, croſs the firſt arc in F.

Draw the lines F D, F E, which will complete the triangle required.

PROBLEM XII.

To divide a given Triangle ABC, *into two equal parts.*

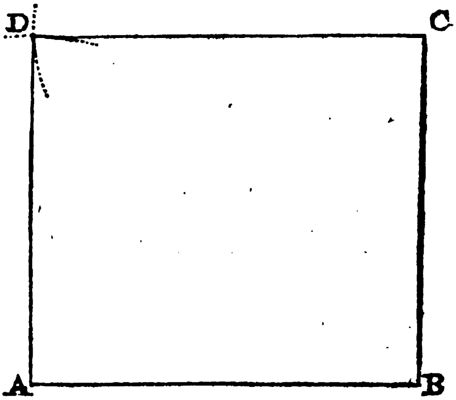


Biſect one of the ſides in D.

Draw a line from D, to the oppoſite angle, which will divide the triangle into two equal parts.

PROBLEM XIII.

To deſcribe a Square, upon a given line AB.



Raiſe a perpendicular, at one end of the given line.

Make the perpendicular B C, equal to A B.

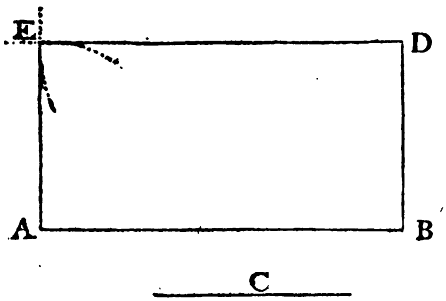
With the radius A B, and C as a centre, deſcribe an arc.

With the ſame radius, and A as a centre, deſcribe another arc croſſing the firſt in D.

Draw the lines D C, D A, which will complete the Square required.

PROBLEM XIV.

To deſcribe a Rectangle, whoſe length and breadth ſhall be equal to two given lines, A B *and* C.



Raiſe a perpendicular at one end of the longeſt line, as at B.

Make the perpendicular B D, equal to the ſhorteſt line C.

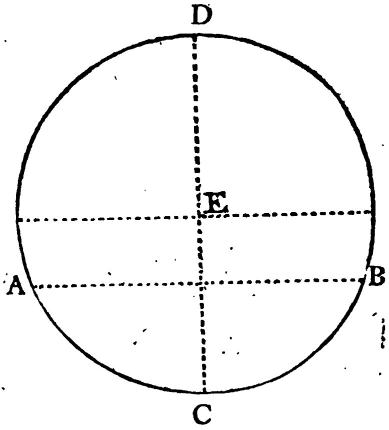
With the radius A B, and D as a centre, deſcribe an arc.

With the radius C, and A as a centre, deſcribe another arc croſſing the firſt in E.

Draw the lines D E and A E, which will complete the Rectangle required.

PROBLEM XV.

To find the Centre of a given circle.

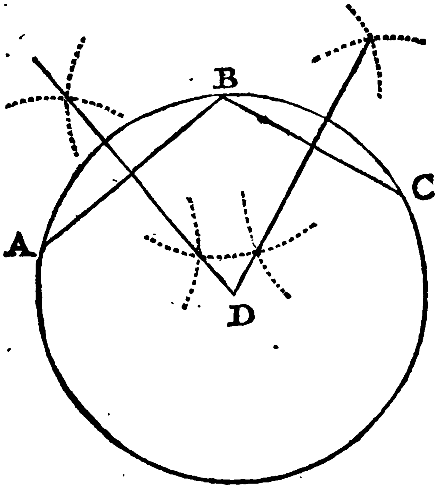


Draw any chord A B, and biſect it at right angles with the perpendicular C D.

Biſect C D in E, which will be the centre of the circle required.

PROBLEM XVI.

Through three given points A, B *and* C, *to deſcribe the circumference of a Circle.*



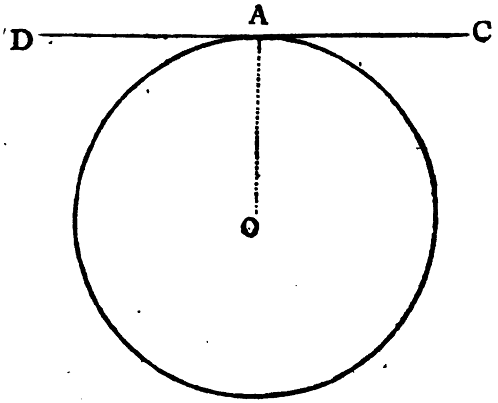
Draw two right lines A B and B C, joining the points A B and B C.

Biſect theſe two lines with two others drawn at right angles to them, and produce them till they meet in the point D.

With the radius D B, or D C, or D A, and D as a centre, deſcribe a circle which will paſs through the points required.

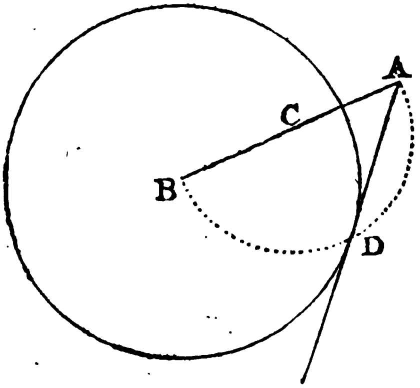
PROBLEM XVII.

To draw a Tangent to a given circle, that ſhall paſs through a given point A, *in the circle.*



Draw the radius A O.
Erect a perpendicular at the end of it A.
Produce the perpendicular to D.
C D, will be the Tangent required.

Case II.—*When the given point* A, *is without the circle.*



Draw a line A B from the given point, to the centre of the circle B.

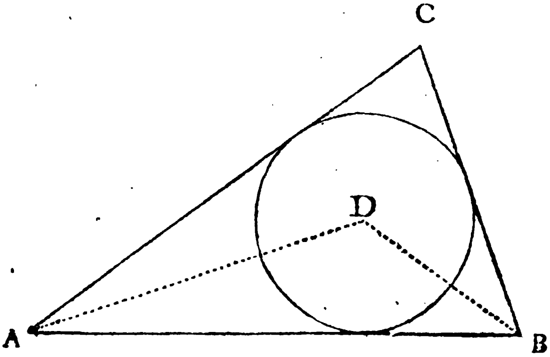
Biſect A B, in C.

With the radius C B or C A, and C for a centre, deſcribe the ſemicircle A D B, cutting the given circle in D.

Draw A D, which will be the Tangent required.

PROBLEM XVIII.

To inſcribe a Circle, in a given triangle ABC.

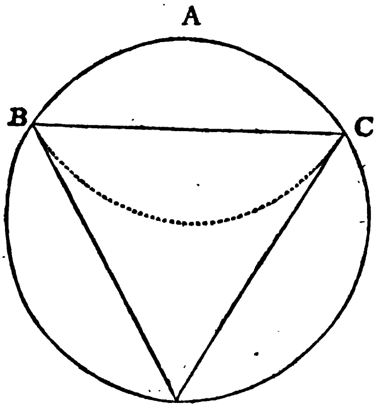


Biſect any two angles with two lines, theſe lines will interſect in the point D, which is the centre of the Circle.

Set one point of the compaſſes in D, and open them till the other point will touch any ſide of the triangle without paſſing through it, with that radius deſcribe the Circle.

PROBLEM XIX.

To inscribe an Equilateral Triangle, in a Circle.

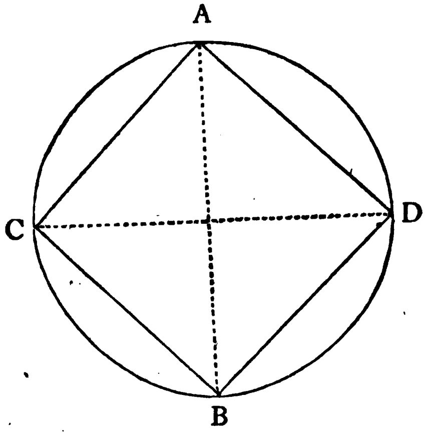


With the radius of the circle, and any point A in the circumference as a centre, deſcribe the arc B C.

Draw the line B C, which will be the ſide of the Equilateral Triangle required.

PROBLEM XX.

To inscribe a Square, in a given circle ABCD.

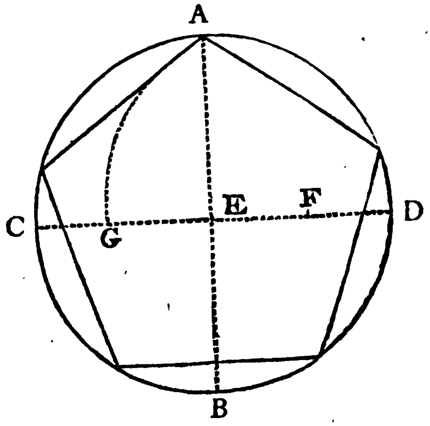


Draw two diameters A B and C D, croſſing each other at right angles.

Draw the lines A D, D B, B C and A C, which will form the Square required.

PROBLEM XXI.

To inſcribe a Pentagon, in a given circle.



Draw two diameters A B and C D, at right angles.

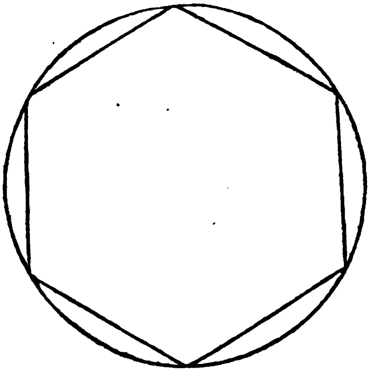
Biſect a radius E D, in F.

With the radius F A, and F as a centre, deſcribe the arc A G.

The diſtance A G, is the ſide of the Pentagon required.

PROBLEM XXII.

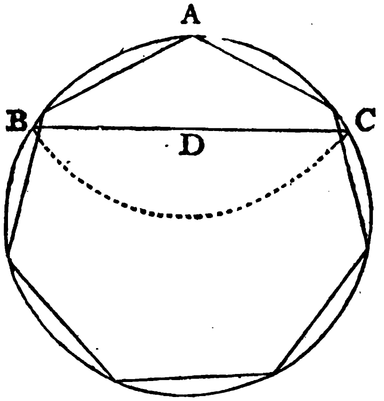
To inſcribe an Hexagon, in a given circle.



Take the radius of the circle, and carry ſix times round the circumference.

PROBLEM XXIII.

To inſcribe an Heptagon in a given circle.



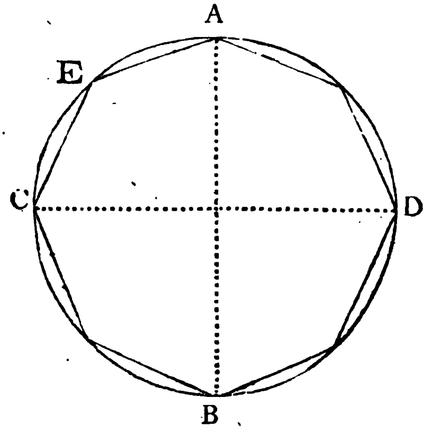
With the radius of the circle, and any point A in the circumference as a centre, deſcribe the arc B C.

Draw the line B C, and biſect it in D.

D B or D C, is the ſide of the Heptagon.

PROBLEM XXIV.

To inscribe an Octagon, in a given circle.



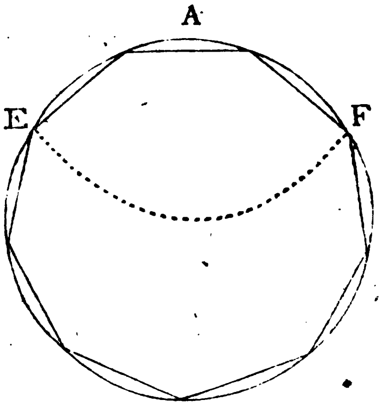
Draw two diameters A B and C D, at right angles.

Biſect the arc A C, in E.

Draw the line A E, which will be the ſide of the Octagon.

PROBLEM XXV.

To inſcribe a Nonagon, in a given circle.



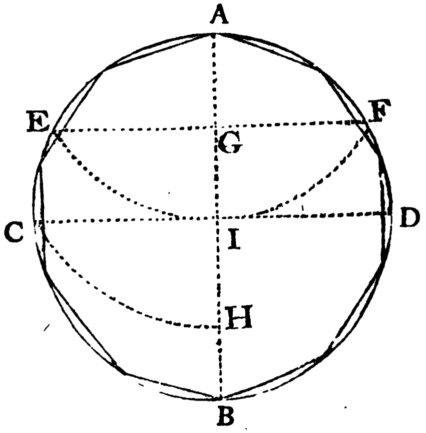
With the radius of the circle, and A as a centre, deſcribe the arc E F.

Divide the arc E A F, into three equal parts.

The chord of any of them will be the ſide of a Nonagon.

PROBLEM XXVI.

To inſcribe a Decagon, in a given circle.



Draw two diameters A B and C D, at right angles.

With the radius of the circle, and A as a centre, deſcribe the arc E F.

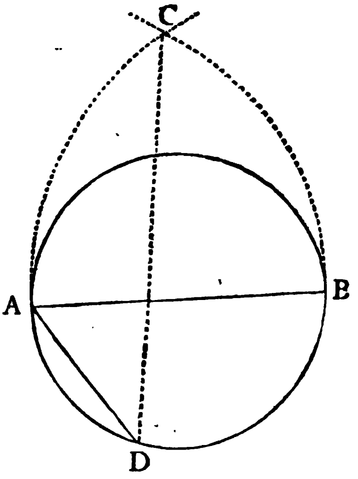
Draw the chord E F.

With the radius G C, and G as a centre, deſcribe the arc C H.

The diſtance from H to the centre I, is the ſide of a Decagon.

PROBLEM. XXVII.

To inſcribe any regular Polygon, in a given circle.



Draw the diameter A B, and divide it into as many equal parts as the Polygon is to have ſides.

With the radius A B, and A as a centre, deſcribe an arc.

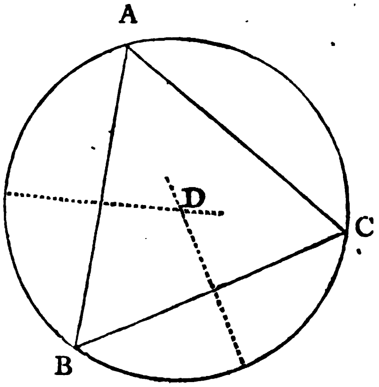
With the ſame radius, and B as a centre, deſcribe another arc croſſing the firſt in C.

From the point C, through the ſecond diviſion of the diameter, draw the line C D.

The chord D A, will be the ſide of the Polygon required.

PROBLEM XXVIII.

To deſcribe a circle, about a given triangle A B C.

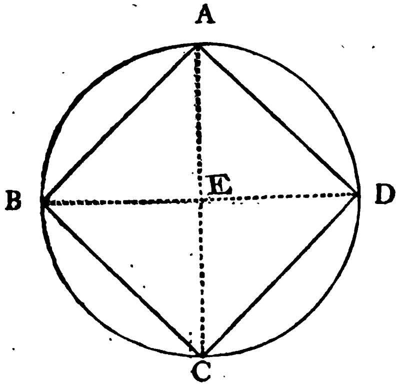


Biſect any two ſides with two lines at right angles, theſe lines will interſect in the point D, which will be the centre of the circle.

With the radius D A, D B, or D C, deſcribe a circle.

PROBLEM XXIX.

To deſcribe a circle, about a given ſquare, ABCD.



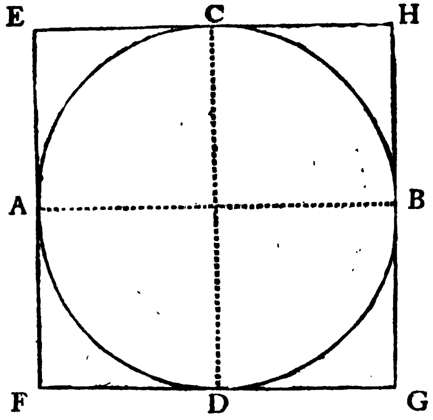
Draw the two diagonals, A C, and B D.

The interſection E is the centre, and the lines A E, B E, C E and D E are radii, with which draw the circle.

Note.—The centres of all regular Polygons, may be found by biſecting two adjoining ſides, or two angles with two lines, which will interſect each other in the centre.

PROBLEM XXX.

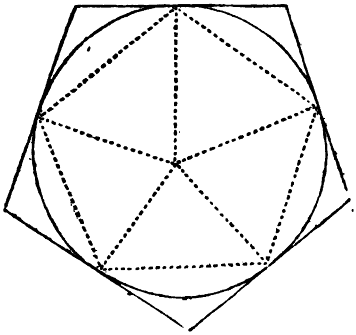
To deſcribe a ſquare, about a given circle.



Draw two diameters A B and C D, at right angles.
Through the point A, draw a line parallel to C D.
Do the ſame at B.
Through the point C, draw a line parallel to A B.
Do the ſame at D.
Theſe lines will interſect in the points E F and G H, and form a ſquare.

PROBLEM XXXI.

To deſcribe any regular Polygon about a circle.

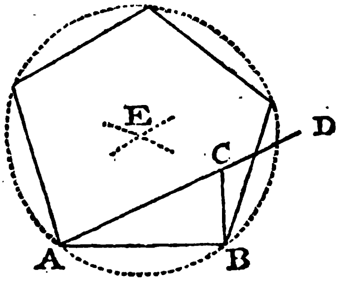


Inſcribe a polygon, with the given number of ſides in the circle.

Draw tangents to the circle at the angular points, which will interſect each other, and form the Polygon required.

PROBLEM XXXII.

To make a regular Pentagon, on a given line A B.



Draw B C perpendicular to A B, and equal to half of it.

Draw A C, and produce it till C D is equal to C B.

With the radius B D, and A as a centre, deſcribe an arc.

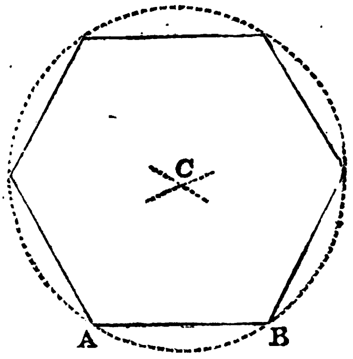
With the ſame radius, and B as a centre, croſs the firſt arc in E.

With the radius E A or E B, and E as a centre, deſcribe a circle.

Apply the given line five times round the circumference of the circle, and the Pentagon will be formed.

PROBLEM XXXIII.

To make a regular Hexagon on a given line A B.



With the radius A B, and A as a centre, deſcribe an arc.

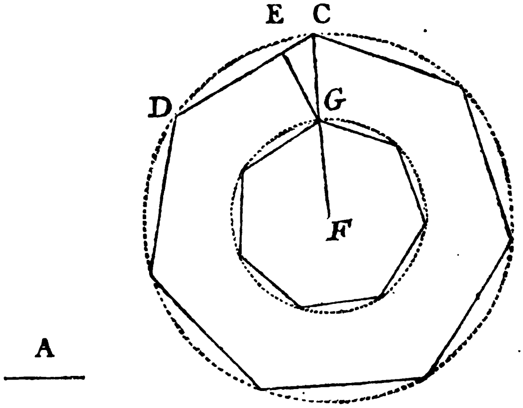
With the ſame radius, and B as a centre, croſs the firſt arc in C.

With the radius C A or C B, and C as a centre, deſcribe a circle.

Carry the line ſix times round the circumference of the circle, and the Hexagon will be made.

PROBLEM XXXIV.

To draw an Heptagon, whoſe ſide ſhall be equal to a given line A.



Inſcribe an Heptagon in a circle, larger than the one required.

Draw the radius C F.

Take half the difference of the two ſides A and C D, and ſet off from C to E.

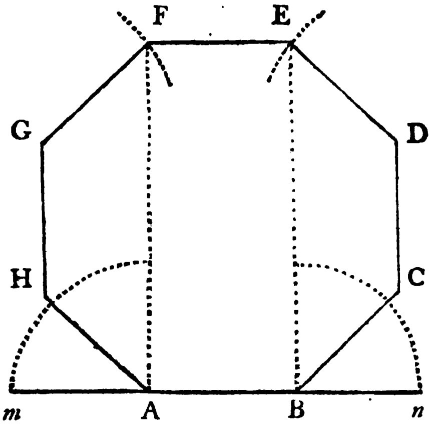
Erect a perpendicular at E, which will cut C F in G.

With the radius G F, and F as a centre, deſcribe a circle, which will admit the line A being carried ſeven times round it.

Note—This rule will do for any other regular polygon.

PROBLEM XXXV.

On a given line A B, *to deſcribe an Octagon.*



On the ends of the given line A B, erect the indefinite perpendiculars A F and B E.

Produce A B both ways to *m* and *n*.

Biſect the angles *m* A F and *n* B E, with the lines A H and B C.

Make A H and B C each equal to A B.

Draw H G and C D, parallel to A F or B E.

Make H G and C D each equal to A B.

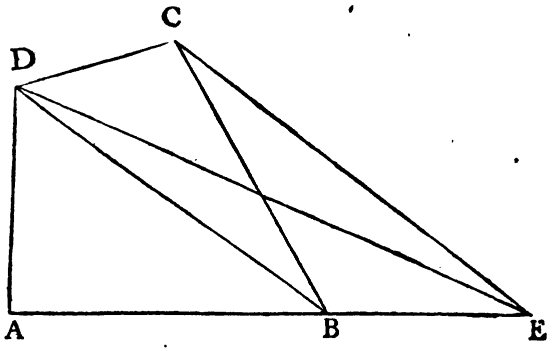
On the centre G, with the radius A B, croſs the line A F in F.

On the centre D, with the ſame radius, croſs the line B E in E.

Draw the lines G F, F E, E D, which will complete the Octagon required.

PROBLEM XXXVI.

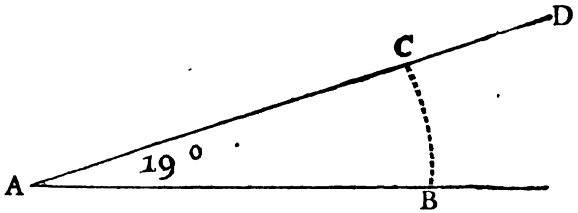
To make a triangle equal to a given trapezium, A B C D.

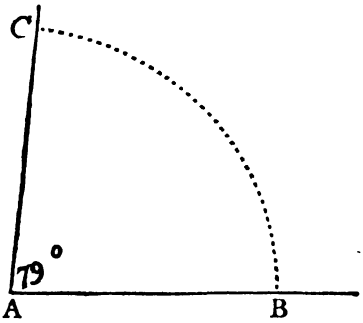


Draw the Diagonal D B.
Draw C E parallel to D B.
Produce A B till it meets C E in E
Draw D E.
A D E will be the Triangle required.

PROBLEM XXXVII.

To make an angle of any propoſed number of degrees.





This and the following problem are eaſieſt to be done by a protractor, for want of which draw the line A B.

Take the firſt 60 degrees from a ſcale of chords as a radius, and with A as a centre, deſcribe an arc B C.

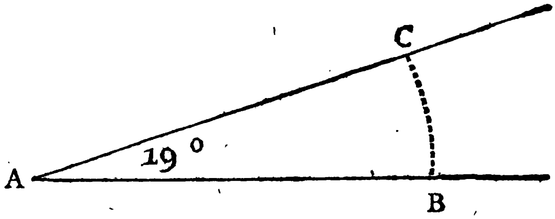
Take the propoſed number of degrees from the ſcale of chords, and ſet off from B to C.

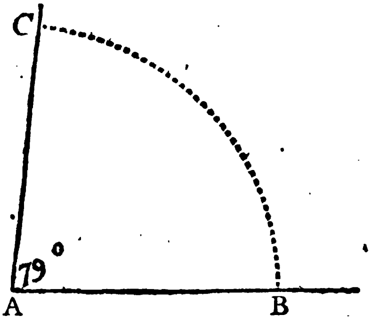
Draw the lines A D, and the angle will be formed.

Note.—If the angle is to contain more than 90 degrees, it muſt be taken at twice.

PROBLEM XXXVIII.

To find the number of Degrees contained in an angle B A C.



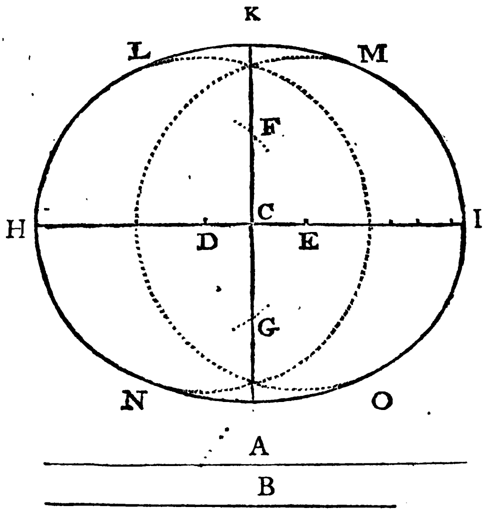


With A for a centre, and a chord of 60 degrees for a radius, deſcribe the arc B C.

Take the diſtance B C and apply to the ſcale of chords, which will ſhow the number of degrees.

PROBLEM XXXIX.

To draw an Oval, whoſe two diameters ſhall be equal to two given lines, A *and* B.



Draw two diameters equal to the two given lines, croſſing each other in the middle at right angles.

Take two thirds of the difference of the diameters, and ſet off from the point of interſection C, on each ſide the longeſt line at D and E.

With the radius D E, and D or E as a centre, croſs the ſhorteſt diameter in F and G.

With the radius D H, and D as a centre, deſcribe a circle.

With the ſame radius, and E as a centre, deſcribe another circle.

With the radius G K, and G as a centre, deſcribe the arc L M.

With the ſame radius, and F as a centre deſcribe the arc N O, which will complete the Oval required.

PART THE SECOND.

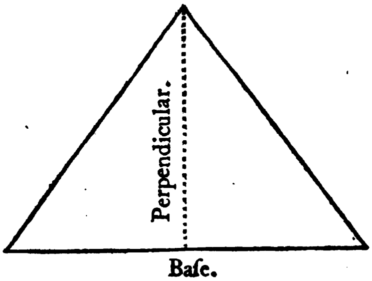
TO MEASURE LAND,

And find the *content* without *plotting*, or uſing *a chain*.

ANY perſon by half an hour's practice, can aſcertain what length in yards he paſſes over, in ſtepping an hundred paces, and by that means can find the length of any line, by walking over it, near enough for common occaſions. This being allowed:

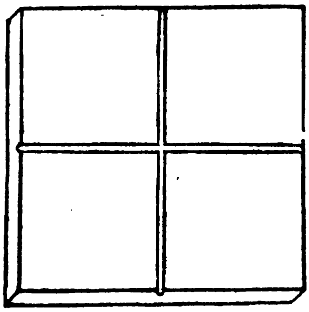
The next thing neceſſary to be underſtood, is ſome of the properties of a Triangle.

The lower ſide is called the baſe, and a line drawn from the angle oppoſite the baſe, and falling upon it at right angles, is called a perpendicular.

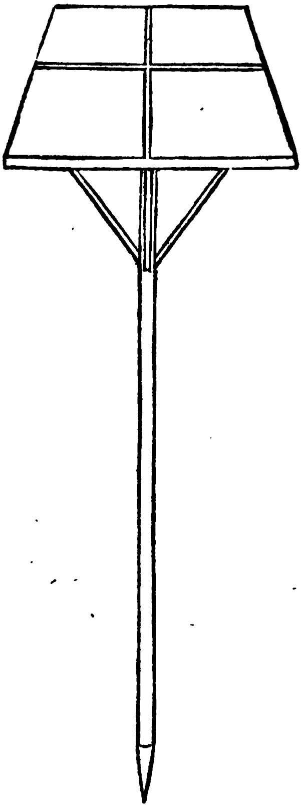


If theſe two be multiplied together, and the Product divided by 2, the Quotient will be the Content.

The length of the Baſe is eaſily meaſured, the only difficulty is in getting a true Perpendicular, to effect which procure a croſs, which may be made of a ſquare piece of wood, with two grooves cut acroſs it at right angles.

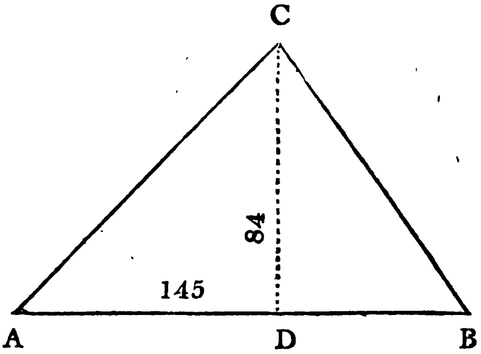


This muſt be faſtened on a Staff about 4 feet long.



A croſs made with braſs, on a different conſtruction to this, but anſwering the ſame purpoſe, may be bought of Meſſrs. Jones, No. 135, Holborn, London. Price 12s.

To ſurvey the triangle A B C.



Place marks at A B and C.

Meaſure from A towards B till you think you are oppoſite the mark at C, there place the croſs at D, apply your eye to one end of the groove, and turn the croſs till it is in ſuch a poſition that you can ſee the mark at A, and the mark B when you look through the other end. Look through the other groove, if you can ſee the mark at C you are in the right place to meaſure the perpendicular; if you cannot ſee it you muſt move the croſs backwards or forwards, till you are in a poſition to ſee the three marks through the grooves without moving the croſs.

Allow the length of the Baſe to be 145 yards, and the perpendicular 84 yards, the content is found thus:

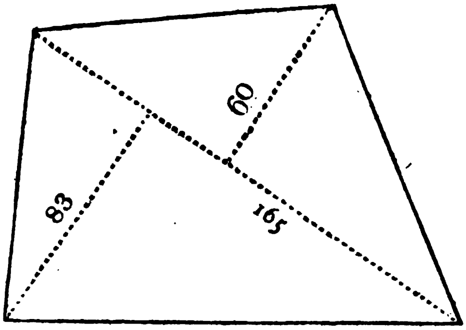
```
         145 Baſe
          84 Perpendicular
        ----
         580
        1160
      ------
   2) 12180
      ------
        6090 Content in Yards.
      ------
```

Divide the content in yards by 4840, (the number of Square Yards in an Acre,) the quotient will be acres, the remainder, if any, multiply by 4, and divide as before, the quotient will be roods; multiply the remainder by 40, and divide as before, the quotient will be poles, thus:

484,0) 609,0 (1 Acre
484
———
125
4
———
484) 500 (1 Rood
484
———
16
40
———
484) 640 (1 Pole
484
———
156

	A	R	P
Content	1	1	1

To ſurvey a Field with four ſides.



Meaſure a diagonal acroſs it, which will divide it into two triangles, and meaſure a perpendicular to each triangle.*

To find the Content.

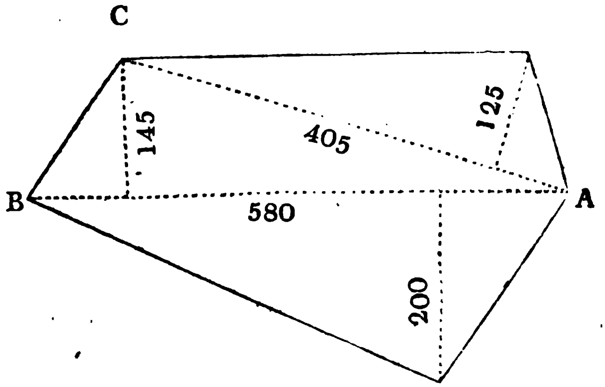
Rule.—Add the perpendiculars together, multiply by the diagonal and divide by 2, the quotient will be the content in yards, which divide by 4840, &c. as before.

---

* Note. Every Trapezium will admit of two Diagonals, it is beſt to chooſe the longeſt.

```
          60 }
          83 } Perpendiculars
         ----
         143
         165 Baſe
         ----
         715
       2288
       ------
  2)  23595
       ------
4840) 11797 (2 Acres
       9680
       -----
       2117
          4
       -----
4840)  8468 (1 Rood
       4840
       -----
       3628
         40
     -------
484,0) 14512,0 (29 Perches
       968
       ----
       4832
       4356
       ----
        476
       ----
                    A R  P
               Ans. 2 1 29
```

The contents of other Fields may be found by dividing them into Triangles, and proceeding as in the two last examples.



In the above figure meaſure two diagonals A B and A C and three perpendiculars, two fall on the diagonal A B, which add together and multiply by the diagonal, &c. as in the laſt example; the other perpendicular falls on the diagonal A C, which proceed with as in the firſt example, the two areas will be yards, which add together and divide by 4840 as before.

200 } 145 } Perpendiculars	125 Perpendicular 405 Baſe
345	625
580 Baſe	5000
27600	2) 50625
1725	25312

2) 200100
100050 Area of the 2 Triangles
25312 Area of the 1 Triangle

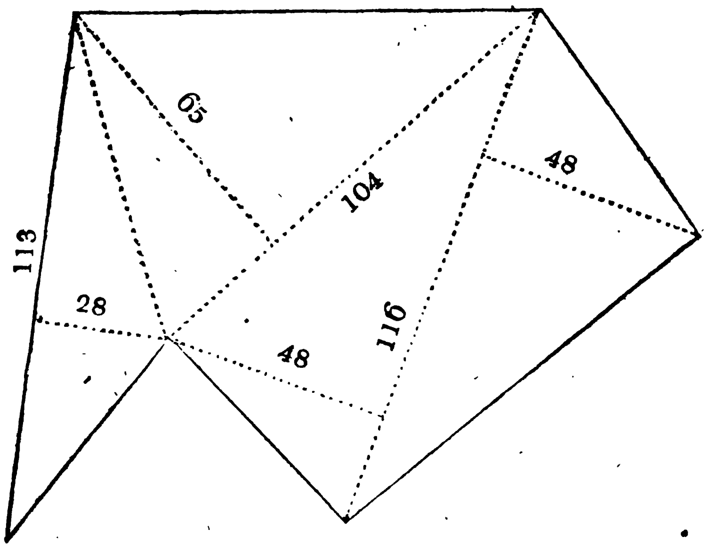
4840) 125362 (25 Acres
9680
28562
24200
4362
4

4840) 17448 (3 Roods
14520
2928
40

484,0) 11712,0 (24 Perches
968
2032
1936
96

A R P
Ans. 25 3 24

What is the Content of the following Field.



48
48 } Perpendiculars

96
116 Baſe

696
1044

11136
6760
3164

2) 21060

484,0) 1053,0 (2A
968

85
4

340 (0R
40

484) 13600 (28P
968

3920
3872

48

65 Perpendicular
104 Baſe

520
624

6760

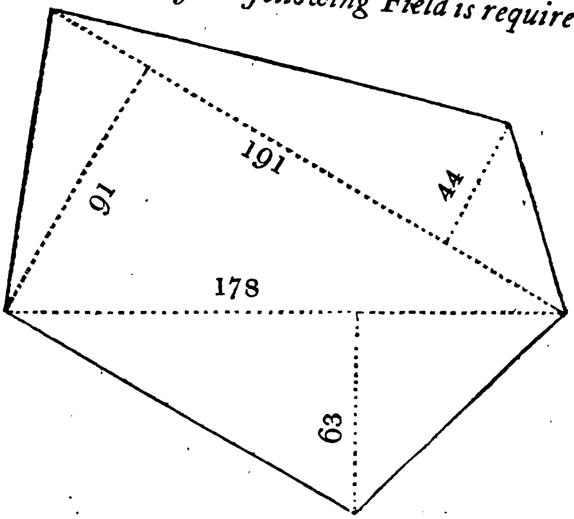
28 Perpendicular
113 Baſe

364
28

3164

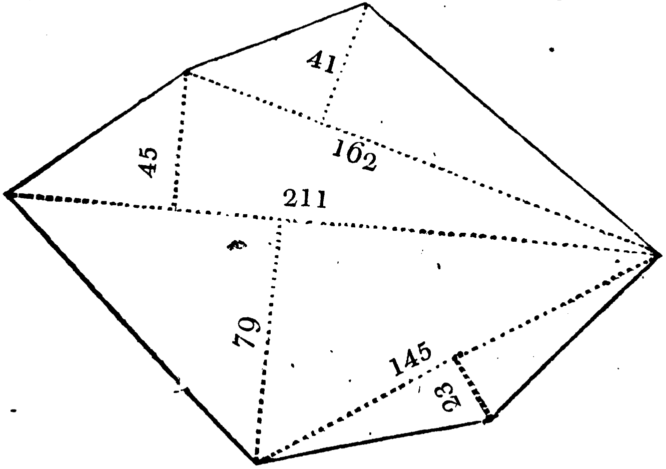
A R P
Ans. 2 0 28

The Content of the following Field is required.



A R P
Content 3 3 11

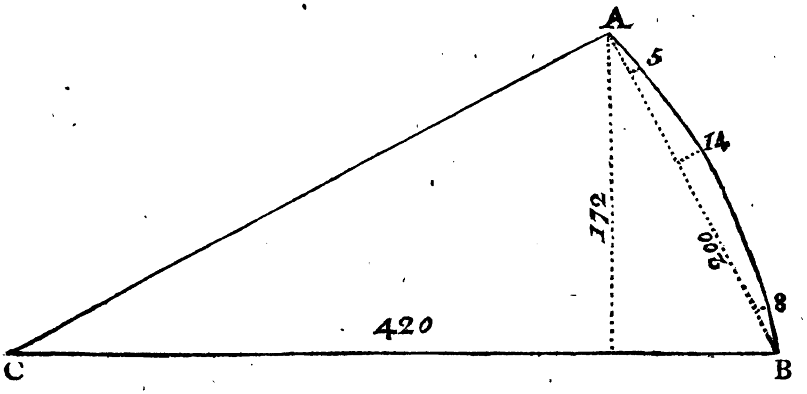
The Content of the following Field is required.



A R P
Content 3 2 37

When the Fences are not ſtraight, obſerve the following directions.

If they have regular curves as A B, proceed in a ſtraight line from A to B, and every 40 or 50 yards take the diſtance from the ſtraight line to the fence, as 5, 14, &c. theſe are called Offsets.



Rule for finding the Area of Offsets. Set each offset down twice, except the firſt and laſt, which ſet down once, add them together, and multiply by the ſtraight line, divide the product by the number of offsets ſet down, the quotient will be the content in yards, let this be added to the area of the triangles and divide by 4840, &c.

Note. The foregoing Rule will do very well for rough calculations, but a more correct one, though not ſo expeditious, is given in Part the Third.

172
420

3440
688

2) 72240

36120 Area of Triangle
1350 Area of Offsets

484,0) 3747,0 (7 A
3388

359
4

484) 1436 (2 R
968

468
40

484) 18720 (38 P
1452

4200
3872

328

0
5
5
14
14
8
8
0

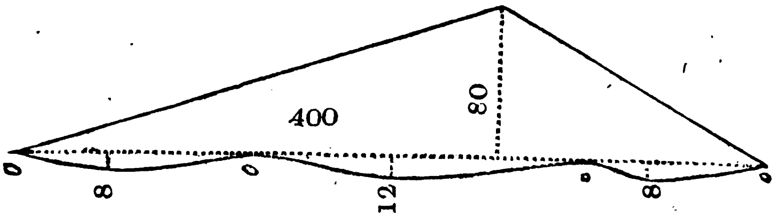
54
200

8) 10800

1350 Yards, Area of Offsets

A R P
Ans. 7 2 38

If the Fence has not a regular curve, take the diſtance at every remarkable bend, thus:

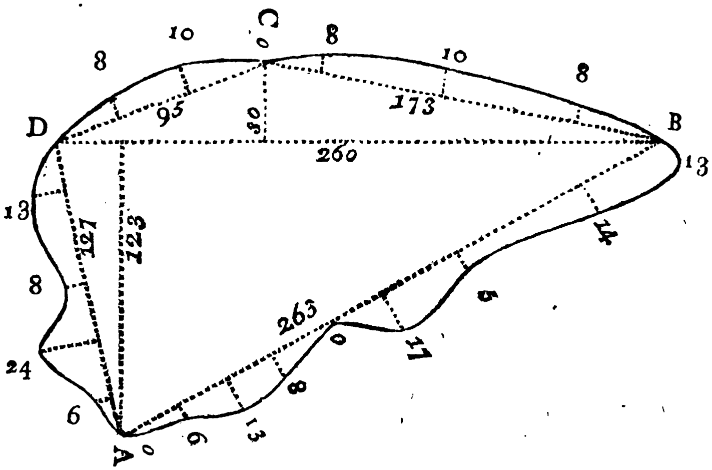


400 Baſe
80 Perpendicular
2) 32000
16000
1866 Area of Offsets
4840) 17866 (3 A
14520
3346
4
4840) 13384 (2 R
9680
3704
40
484,0) 14816,0 (30 P
1452
296

0
8
8
0
0
12
12
0
0
8
8
0
56
400
12) 22400
1866

A R P
Ans. 3 2 30

The Content of the following Field is required.

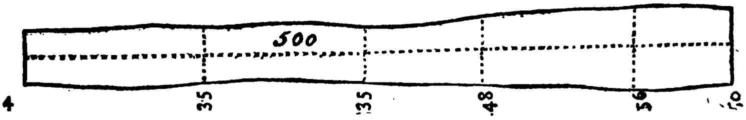


```
                                        A B
                                        13
              123                       14
               30                       14
             ----                        5
              153                        5
               260                      17
              ----                      17
              9180                       0
             306                         0
             -----                       8
        2) 39780                         8
           -----                        13
           19890                        13
        ⎧ 2284 = AB                      6
Offsets ⎨ 1295 = DA                      6
        ⎪  570 = CD                      0
        ⎩ 1124 = BC                   ----
           -----                      139
  4840) 25163 (5 A                    263
        24200                         ----
        -----                         417
          963                        834
            4                       278
          ----                     -----
         3852 (0 R              4) 36557
           40                      -----
        -----                   4) 9139
 484,0) 15408,0 (31 P              ----
        1452                       2284
        -----                      ----
          888
          484
         ----
          404
         ----
```

DA	BC	CD
0	0	0
6	8	8
6	8	8
24	10	10
24	10	10
8	8	0
8	8	——
13	0	36
13	——	95
0	52	——
——	173	180
102	——	324
127	156	——
——	884	6) 3420
714	——	——
1224	8) 8996	570
——	——	——
10) 12954	1124	
——	——	
1295		
——		

A R P
Ans. 5 0 31

The beſt method to find the Content of a long narrow piece of Land, of an irregular width, lying either in a ſtraight direction, or a curving one, is by meaſuring a line along the middle of it, and meaſuring the width in different places, let theſe widths be treated as Offsets, and multiplied into the Chain-Line, &c. as before directed.



50
56
56
48
48
35
35
35
35
40

438
500

10) 219000

484,0) 2190,0 (4 Acres
1936

254
4

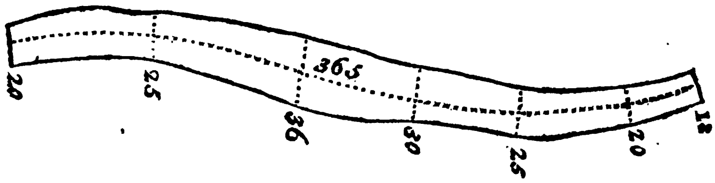
484) 1016 (2 Roods
968

48
40

484) 1920 (3 Perches
1452

468

	A	R	P
Ans.	4	2	3



18
20
20
25
25
30
30
36
36
25
25
20

310

310
365

3650
1095

12) 113150

4840) 9429 (1 A
4840

4589
4

4840) 18356 (3 R
14520

3836
40

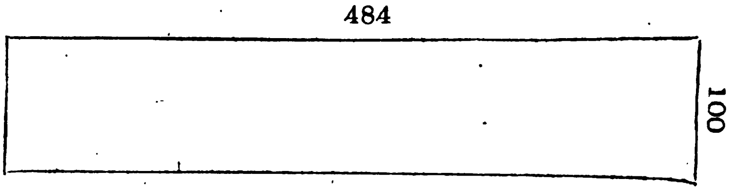
484,0) 15344,0 (31 P
1452

824
484

340

A R P
Ans. 1 3 31

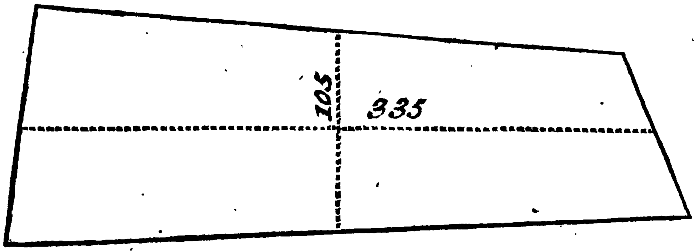
If a piece of land is of a regular width from one end to the other, multiply the length by the breadth, the Product will be the Area.



484
100

4840) 48400 (10 Acres
48400

If the Fences are ſtraight, but the Field wider at one end than the other, meaſure the length and breadth acroſs the middle, which being multiplied together, will give the Area,



335
105

1675
3350

4840) 35175 (7 Acres
33880

1295
4

484,0) 518,0 (1 Rood
484

34
40

484) 1360 (2 Perches
968

392

A R P
Ans. 7 1 2

PART THE THIRD.

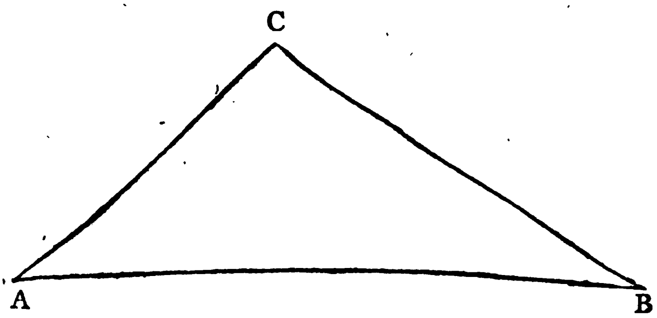
TO SURVEY WITH

THE CHAIN AND CROSS.

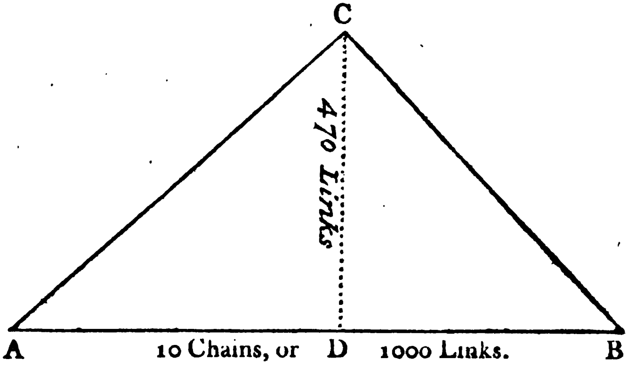
Examine the chain, which muſt contain 100 links, and be 22 yards in length. Provide 10 iron rods about 2 feet long of thick wire, fixed in wooden handles painted red. An offset-ſtaff 10 links long, divided into links. Several ſtaffs about 6 feet long for marks. Field-book, pen and ink.

To ſurvey the Triangle ABC.

Draw a rough ſketch in the Field-book, thus:



Set up marks at the angles A B C, begin to meaſure the longeſt line at A, let the perſon who leads the chain take the rods, and when he has proceeded to the length of the chain, the follower muſt direct him to get in a ſtraight line, with the mark at B, he muſt there put down a rod at the end of the chain, proceed to the length of another chain, and put down another rod, (the follower muſt take the rods up as he comes at them, and by that means, keep an account of the line he is meaſuring,) proceed thus till arrived at the proper place D, to meaſure a perpendicular from, which may be found with the croſs as before directed, (page 54) leave a mark at D, and finiſh meaſuring the baſe, allow it to be 10 chains, then meaſure the perpendicular, allow it to be 4 chains 70 links. NOTE. It is beſt to make uſe of the number of links inſtead of chains, they being as eaſily expreſſed and more convenient to work with.



To find the Content.

RULE. Multiply the baſe and perpendicular together, and divide the product by 2, the quotient will be links, which divide by 100000, (the number of ſquare links in an acre,) the quotient will be acres.

The beſt method of dividing by 100000, is to count five figures from the right to the left hand, and cut them off, what remain will expreſs the number of acres, multiply the five figures by 4, cut off as before, what remain will be roods, multiply the laſt five figures by 40, and cut off as before, what remain will be poles.

The work of the laſt Example.

470 Perpendicular
1000 Baſe

2) 470000

2,35000
4

1,40000
40

16,00000

A R P
Ans. 2 1 16

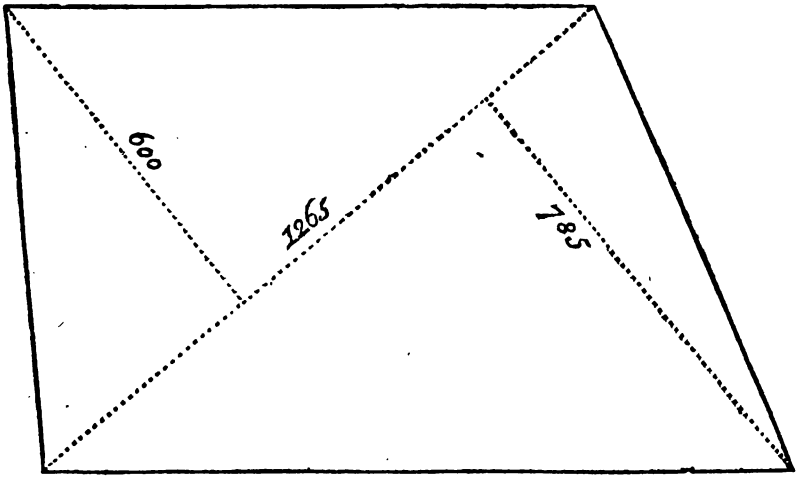
To ſurvey a Trapezium or Field which has four ſides.

Meaſure a diagonal acroſs it, which will divide into two triangles, and meaſure a perpendicular to each triangle.

To find the Content.

Add the two perpendiculars together, multiply by the diagonal, and divide by 2, the quotient will be the content in links, which divide by 100000 &c. as before.

What is the Content of the following Field?



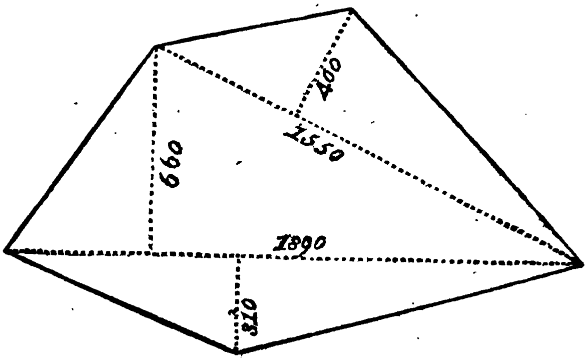
600 } Perpendiculars
785 }
1385

1385
1265 Diagonal
6925
8310
16620
2) 1752025
8,76012
4
3,04048
40
1,61920

Ans. A 8 R 3 P 1

All other Fields may be ſurveyed by dividing them into Trapeziums and Triangles, and their Contents found as in the two laſt examples.

The Content of the following Field is required.



1550
400

620000

660
310

970
1890

132300
17010

1833300
620000

2) 2453300

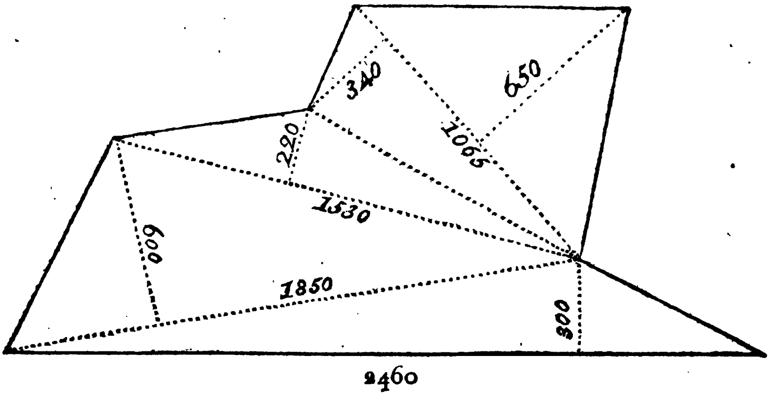
12,26650
4

1,06600
40

2,64000

A R P
Ans. 12 1 2

What is the Content of the following Field?



650
340

990
1065

95850
9585

1054350

1530
220

30600
3060

336600

1850
600

1110000

2460
300

738000
1054350
336600
1110000

2) 3238950

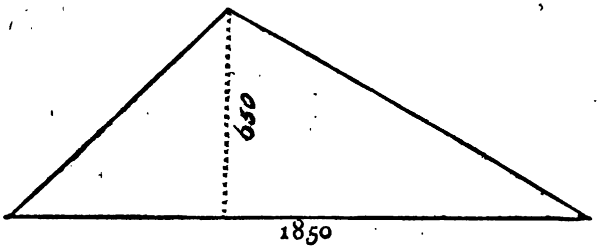
16,19475
4

,77900
40

31,16000

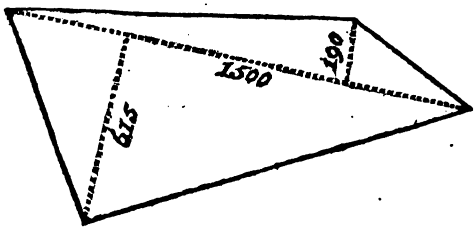
A R P
Ans. 16 0 31

What is the Content of the following Field?



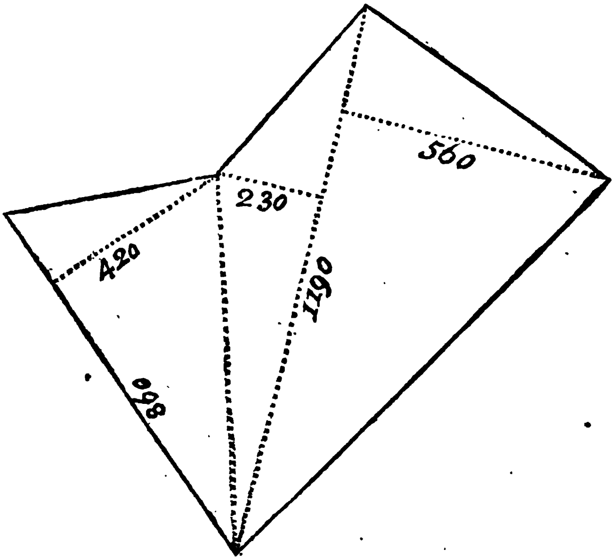
	A	R	P
Ans.	6	0	2

What is the Content of the following Field?



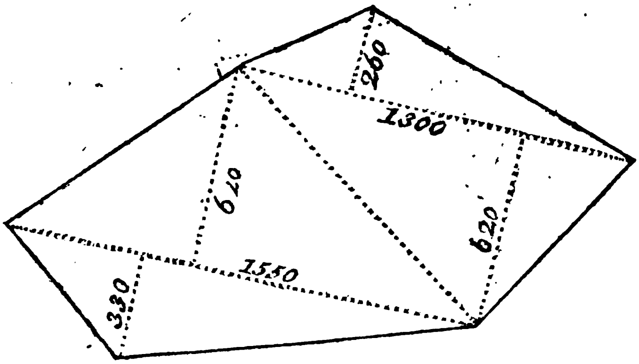
	A	R	P
Ans.	6	0	6

What is the Content of the following Field?

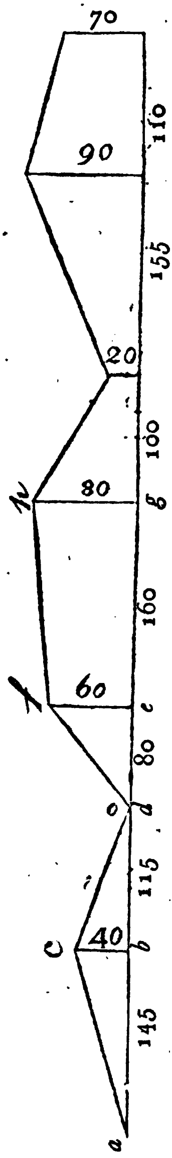


	A	R	P
Ans.	6	2	1

What is the Content of the following Field?



	A	R	P
Ans.	13	0	38



When a Boundary is not ſtraight, a ſtraight line muſt be meaſured as near to it as can be, and offsets meaſured in a perpendicular direction from the chain-line to the boundary, at every angle or corner, thus:

The offsets will form right angled triangles, as *a b c*, or trapezoids as *e f g h*.

Rule for computing the Contents of Offsets.

For a triangle, multiply the perpendicular and baſe together, and for a trapezoid multiply the ſum of the two perpendiculars by the baſe, add all the products together and divide by 2, the quotient will be the content.—NOTE. When one perpendicular belongs to two triangles, as *b c*, treat them as one triangle, and multiply *a d* into *b c*.

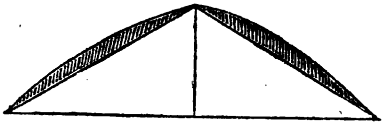
In meaſuring a line which has offsets, note down in the rough ſketch the diſtance of each offset, from that end of the line you began to meaſure from.

The length of each baſe may then be found, by ſubtracting the firſt diſtance from the ſecond, the ſecond from the third, &c. &c. this will be eaſily underſtood, by inſpecting the annexed figure, and the following work.

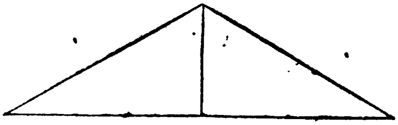
```
     90          90         20
     70          20         80
   ----        ----       ----
    160         110        100
    110         155        100
   ----        ----       ----
  17600       17050      10000
  -----       -----      -----

         60          60        260
         80          80         40
       ----        ----      -----
        140        4800      10400
        160        ----      -----
       ----
      22400
      -----
                   17600
                   10000
                    4600
                   17050
                   22400
                    5800
                    4800
                   -----
                2) 82250
                   -----
                   41125 Content in Links
                   -----
```

The foregoing rule will produce the exact content when the angles are formed with ſtraight lines; but if the lines are curving ones, there will be a little variation, as appears by the three following figures;

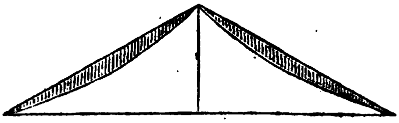
1.



2

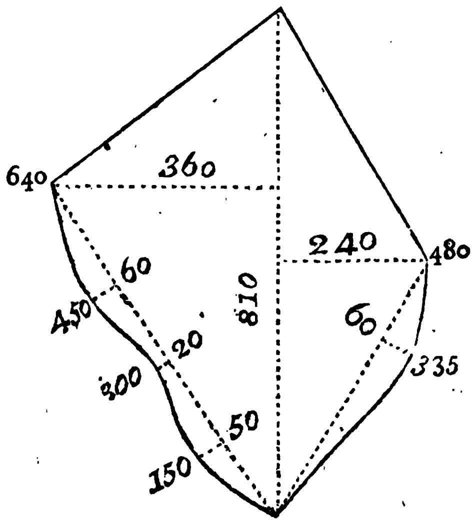


3



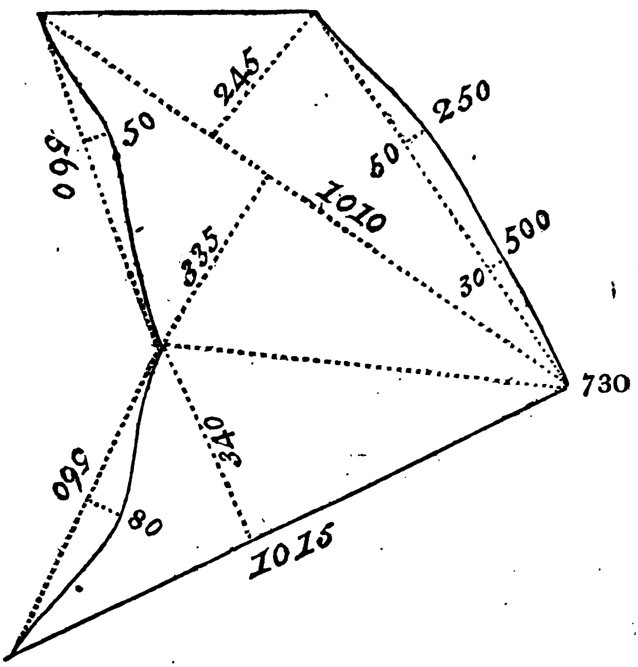
which by the foregoing rule, will all produce the ſame content; though the firſt is more than the ſecond by its ſhadowed part, and the third leſs than the ſecond by its ſhadowed part. See more on this ſubject Part the Sixth.

To find the Content of the following Field.



```
       360         60        150         50
       240        480         50         20
      ----       ----       ----       ----
       600      28800       7500         70
       810       ----       ----        150
      ----                             ----
    486000                            10500
     28800                             ----
      7500
     10500
     12000
     11400         20         60
      ----         60        190
2)  556200       ----       ----
      ----         80      11400
   2,78100        150       ----
         4       ----
      ----      12000
   3,12400       ----
        40
      ----
   4,96000
      ----

                           A  R  P
                      Ans. 2  3  5
```

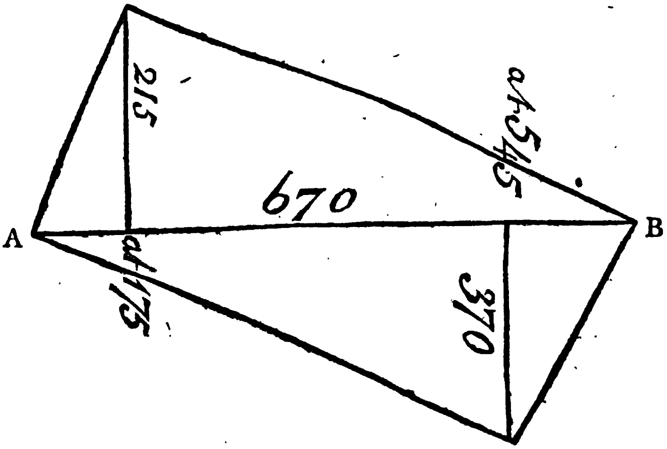
To find the Content of the following Field.



```
     245       1015     250     50      230
     335        340      50     30       30
   -----      -----   -----  -----    -----
     580      40600   12500     80     6900
    1010      3045    -----    250    -----
   -----     ------          -----
    5800     345100          20000
   5800      ------          -----
  ------
  585800
  345100 )
   12500 ( Offsets added
   20000 (
    6900 )
  ------
  970300
   72800 Offsets ſubtracted
  ------
2) 897500           560          560
  ------             80           50
 4,48750           ----         ----
       4          44800        28000
  ------          -----        44800
  1,9500                       -----
      40                       72800
  ------                       -----
   38,00
  ------

                               A  R  P
                          Ans. 4  1  38
```

The foregoing rules are deſigned to find the content of any piece of land, without drawing the plot; but the plot of any of them may be drawn from the ſame memorandums, by noting in what part of the baſe-line the perpendiculars are raiſed, thus:

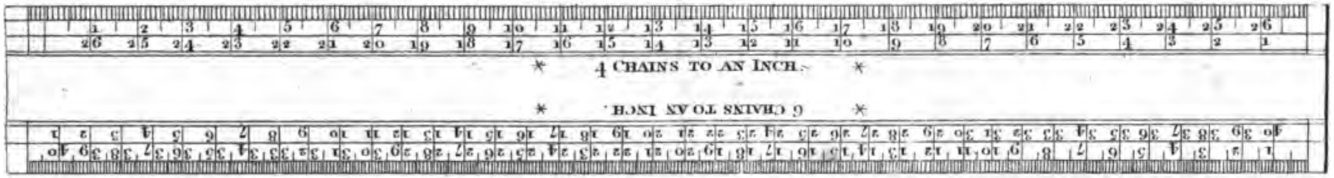
Suppoſe the following rough ſketch to be taken in the Field.



Take the length of the diagonal A B 670 off a plotting ſcale, and draw it on paper.

Plate I.

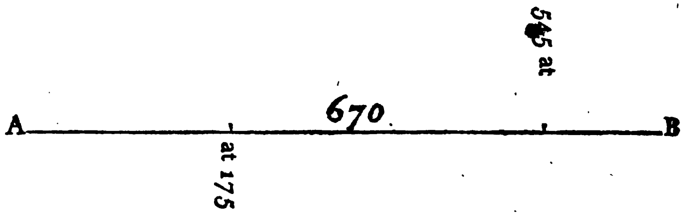
PLOTTING SCALE.



The use of this Scale is too obvious to need much explanation; Every long division marked 1.2.3 &c is 1 Chain or 100 Links & every short division 10 Links.

Dix delin. *Vincent sculp.*

London. Published as the Act directs, Oct.r 1. 1799, by L.B. Seeley & T. Dix.

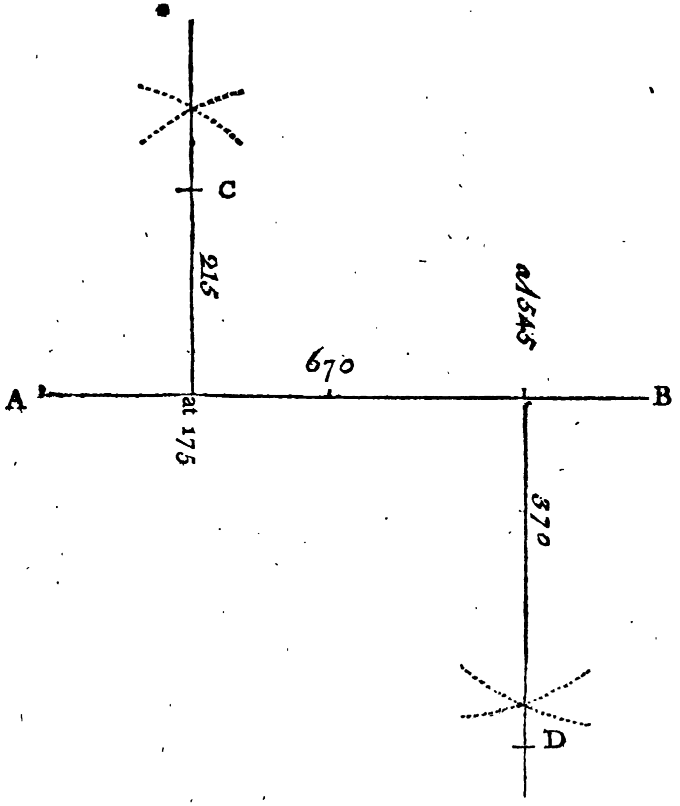


Take the diſtance of the firſt perpendicular 175, and ſet off from A towards B.

Take the diſtance of the ſecond, and ſet off in the ſame manner.

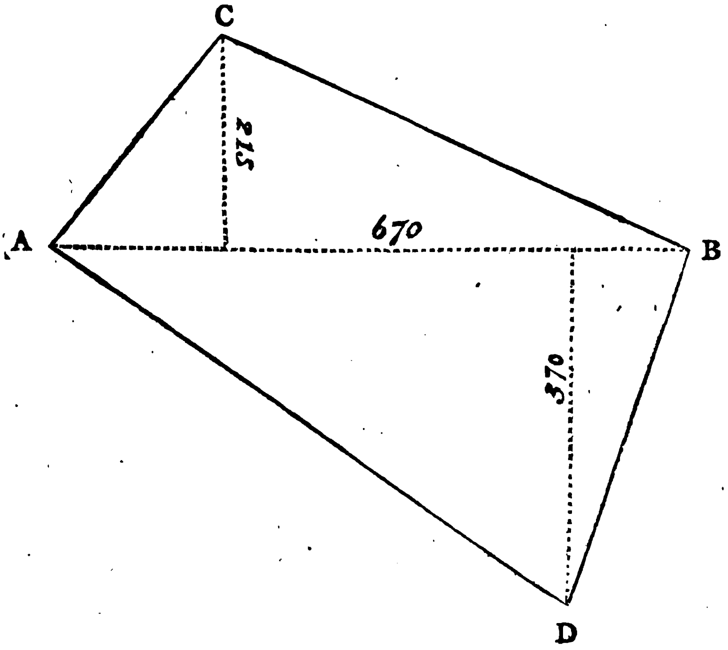
From each of theſe points draw a perpendicular by Problem 2d, Page 17, or with a ſmall ſquare, made of braſs or wood.

Make the firſt perpendicular 215, and the ſecond 370.



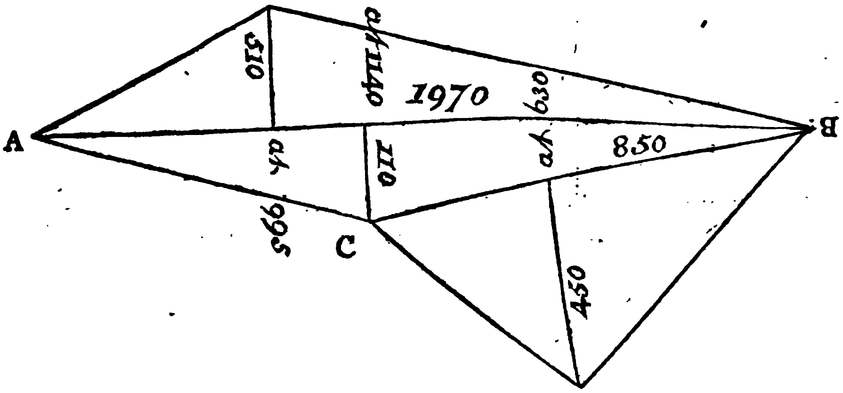
Draw the lines AC and BC.
Draw the lines AD and DB.

The Plot will appear thus:

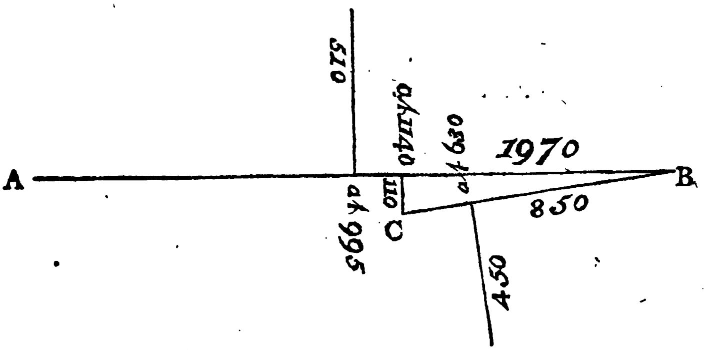


	A	R	P
Ans.	1	3	33

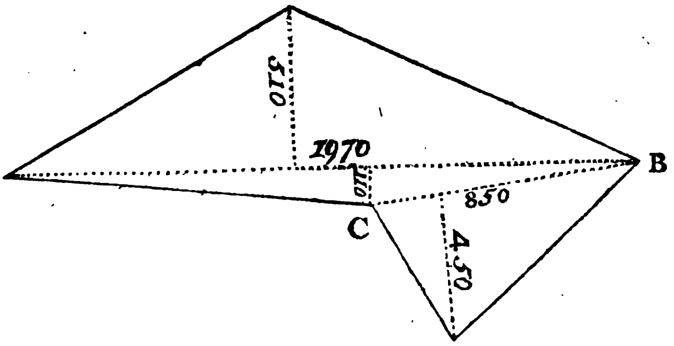
It is required to draw the plan and find the Content of a Field, from the following rough ſketch.



FIRST STEP.

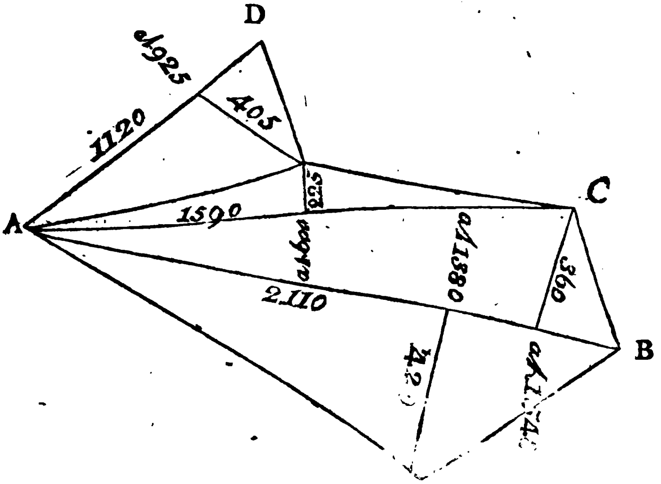


SECOND STEP.

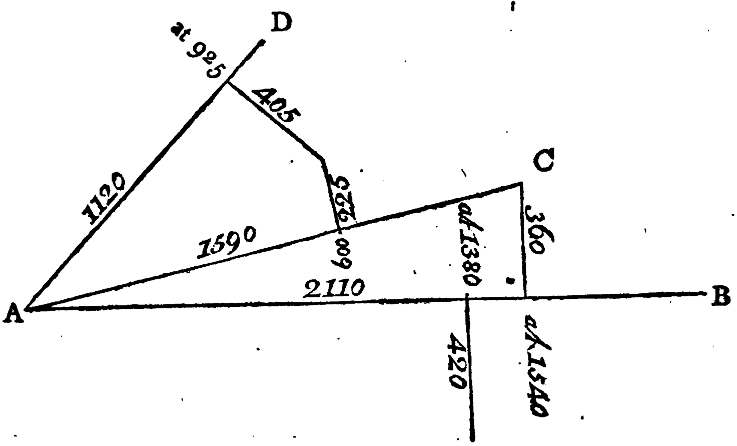


A R P
Content 8 0 3

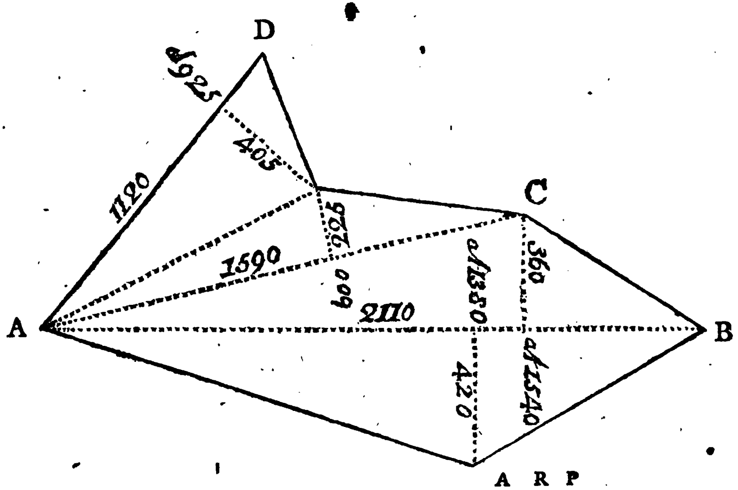
It is required to draw a plan, and find the Content of a Field, from the following rough ſketch.



FIRST STEP.



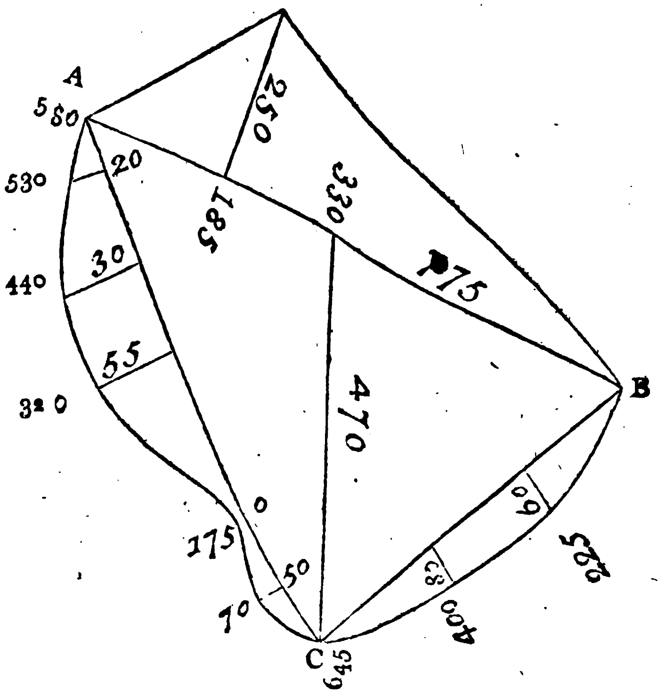
SECOND STEP.



A R P
Ans. 12 1 5

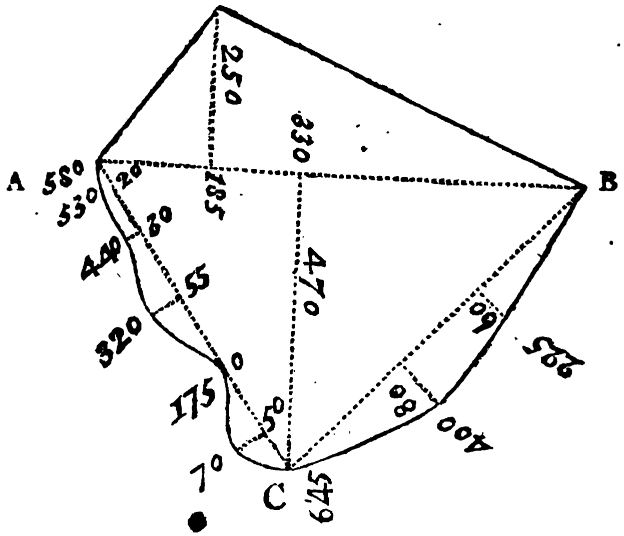
If the Field has Offsets, the lines to which they belong muſt be meaſured as before directed; and in the rough ſketch, note down the diſtance of each Offset from that end of the line you began to meaſure from, thus:

ROUGH SKETCH.



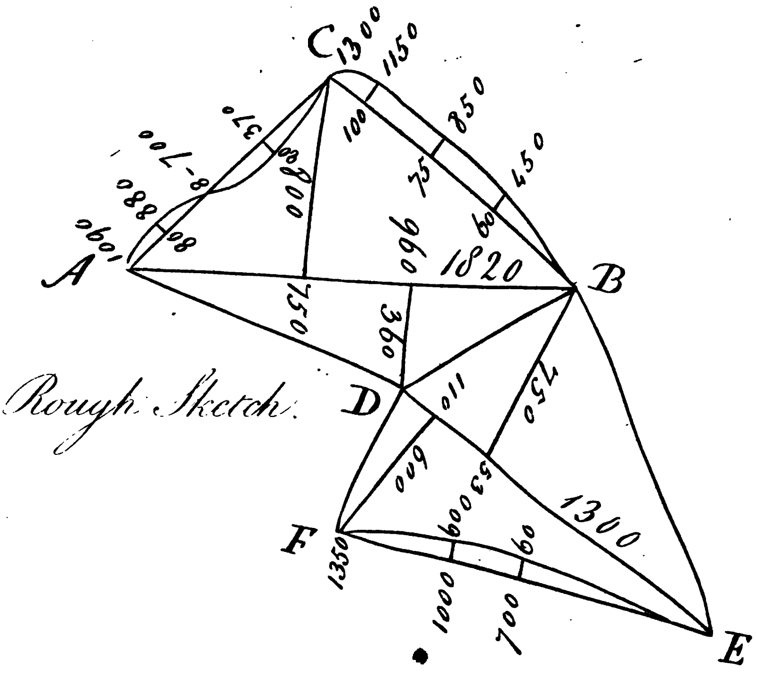
[illegible] as the Act directs, Oct.r 1, 1790 by L.B. Seeley & T. Dix. Vincent sc.

The foregoing when plotted will appear thus:

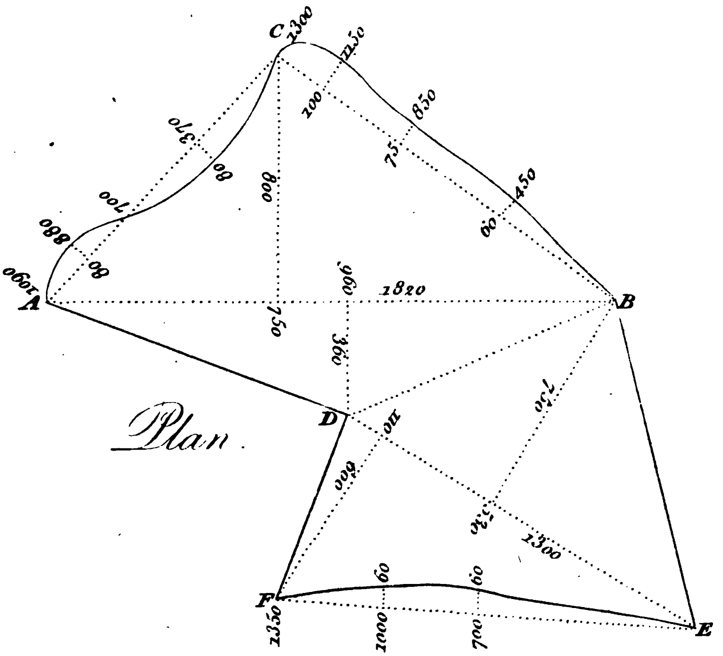


Draw a plan, and find the content of a Field, from the annexed rough ſketch: Plate 2nd.

	A	R	P
Content	19	1	32



Rough Sketch.



Plan.

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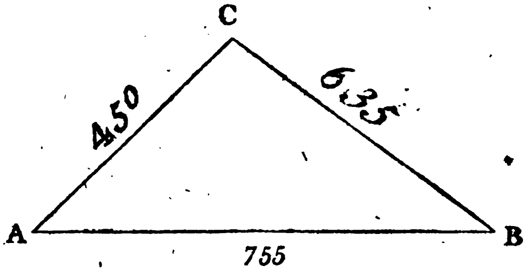
PART THE FOURTH.

TO SURVEY

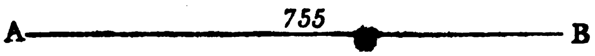
WITH THE CHAIN.

DRAW a rough ſketch of the Field on paper, either by going round it, or by drawing the lines as they are meaſured.

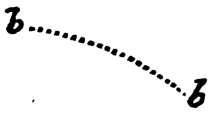
If a triangular Field is to be ſurveyed, meaſure the three ſides, and note down the length of each in the rough ſketch, thus:

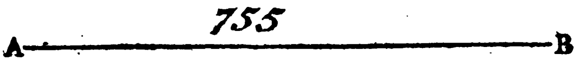


This muſt be accurately plotted before the content be found. To do which, take the length of the longeſt ſide off the ſcale with the compaſſes, and draw it on paper.

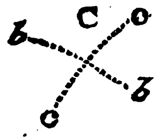


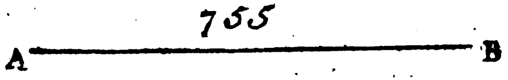
Take the length of another line, AC 450, ſet one point of the compaſſes on A, and draw the arc *b b*.



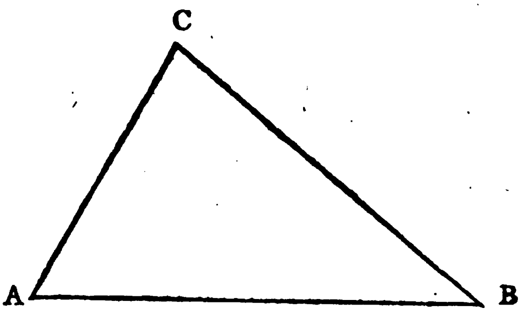


Take the length of the other line BC 635, and with B for a centre, draw the arc *c c*.

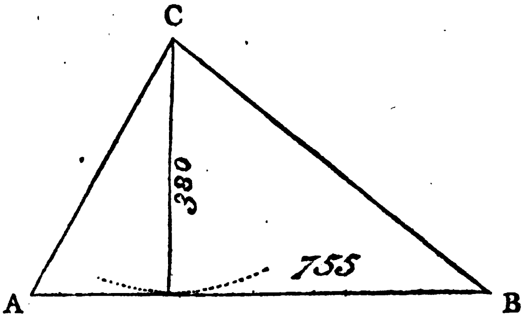




From the point of interſection C, draw the lines AC, and BC, which will complete the plot.



Then let fall a perpendicular from the point C, on the line AB, by Problem III. page 17: meaſure the length of the perpendicular on the plotting ſcale, and it will be found to be 380 links: or open the compaſſes to ſuch a width as will deſcribe an arc touching the baſe AB, without paſſing through it.



Meaſure that diſtance on the plotting-ſcale, and it will be found the ſame as before, 380 links.

The content muſt be found as before directed.

755

380

60400

2265

2)286900

1,43450

4

1,73800

40

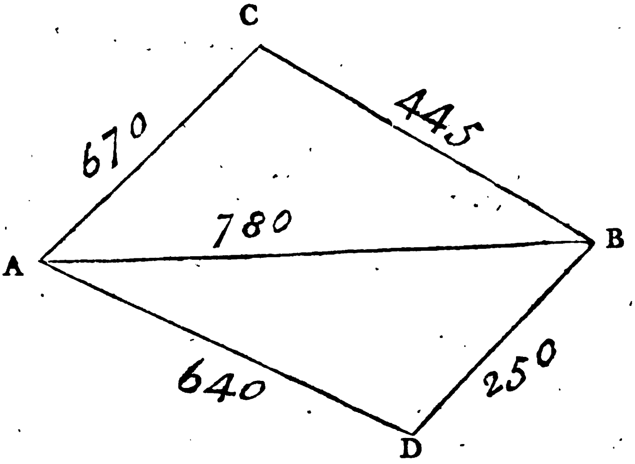
29,52000

A R P

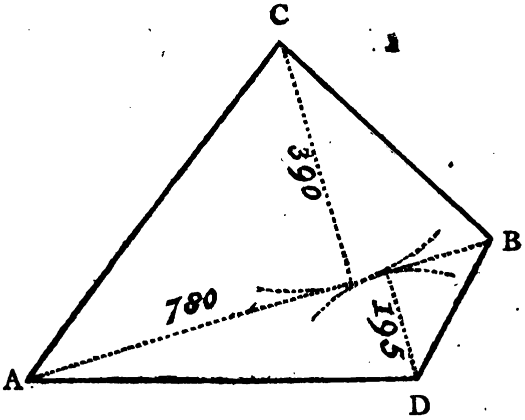
Ans. 1 1 29

To ſurvey a Field which has four ſides.

Draw a rough ſketch of the Field, and a diagonal acroſs it. Note down the length of each ſide, and the diagonal thus:



On the diagonal AB, draw the two triangles ABC, and ABD, and meaſure a perpendicular to each as in the laſt example.

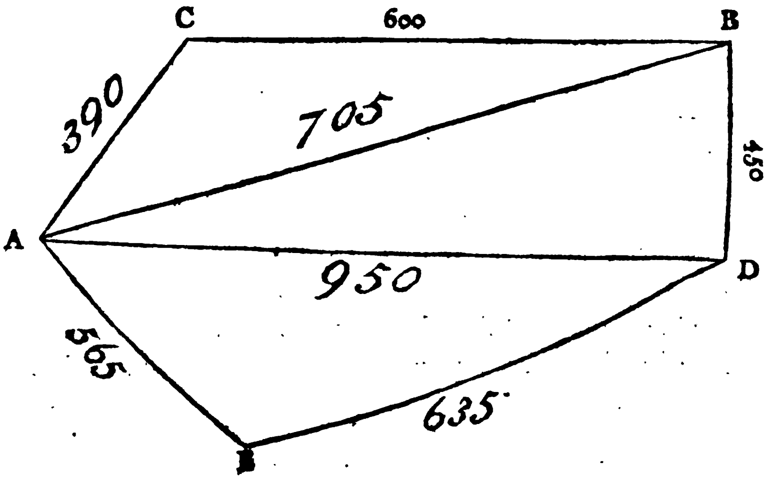


	A	R	P
The Content is	2	1	5

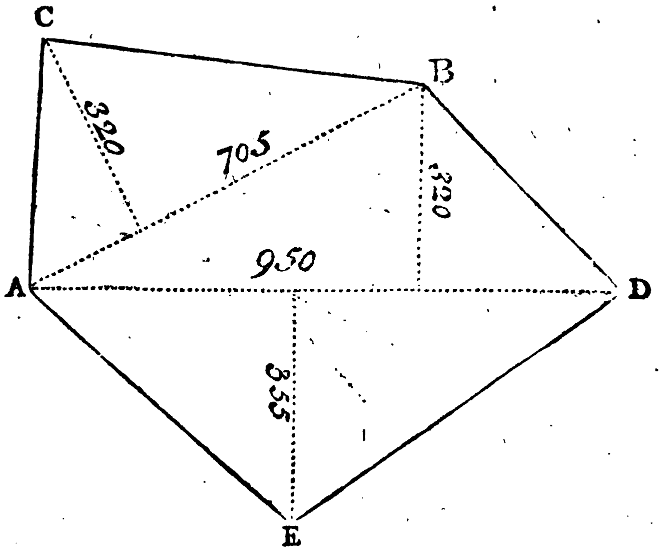
H 4

Any other Field may be ſurveyed in the ſame manner, by meaſuring as many diagonals as will divide it into triangles.

Required the Plan and Content of a Field, from the following ſketch.



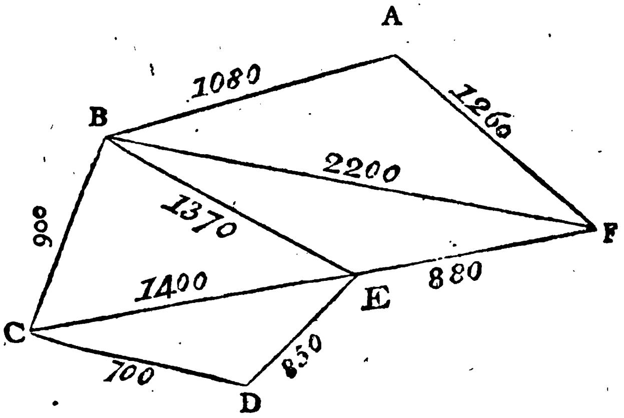
PLAN.



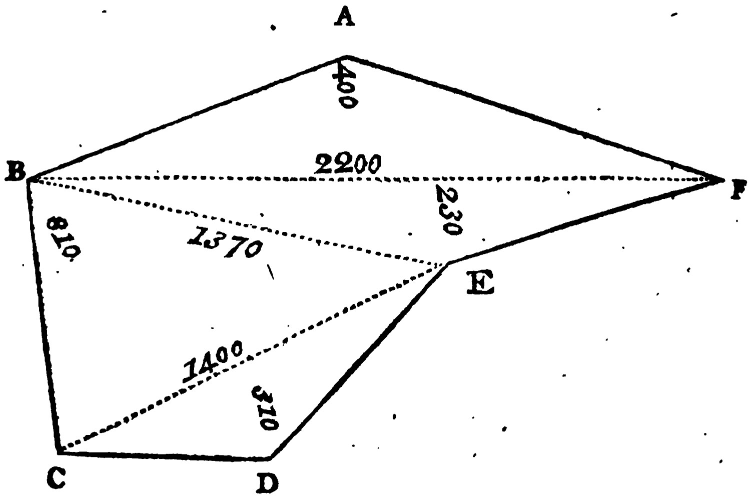
	A	R	P
Content	4	1	13

Draw a Plan, and find the Content of the following Field.

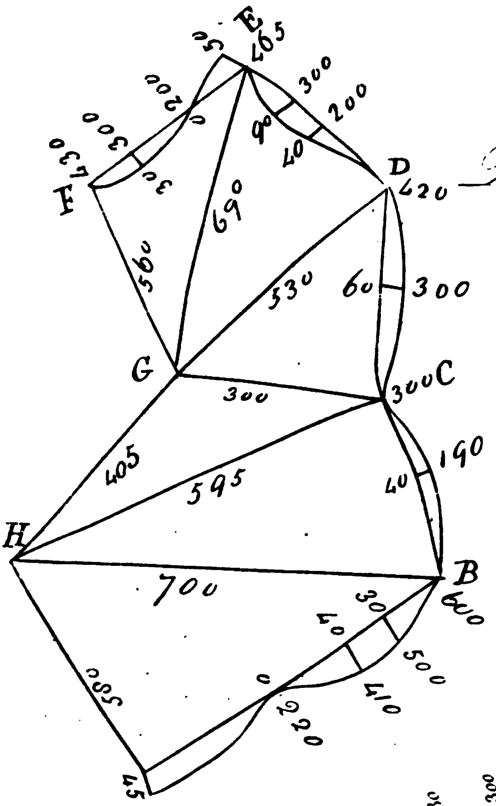
ROUGH SKETCH.



PLAN.

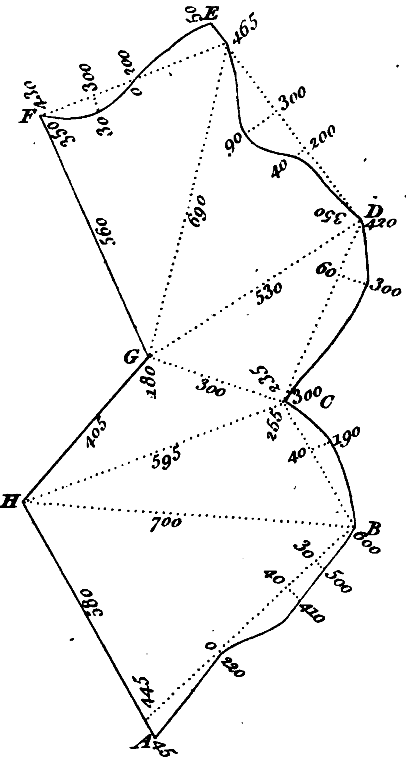


	A	R	P
Content	14	3	3



Rough Sketch.

Plan:



A R P
Content 6 . 0 . 28

lebin. London, Published as the Act directs, Oct.r 2.1799. by L.B. Seeley & T. Dix. Vincent sculp.

Draw a Plan and find the Content of a Field, from the rough ſketch. Plate 3rd.

```
      350        235        445        595
      350        530        255        180
     ----       ----       ----       ----
      700       7050        700     107100
      690     1175          700     ------
     ----     ------       ----
   483000     124550     490000
   124550     ------     ------
   107100
   490000                B C           C D
    26800=AB             300           420
    12000=BC              40            60
    25200=CD            ----          ----
    10000=Eo           12000         25200
   -------             -----         -----
  1278650
  - 42750                E o           o F
  -------                50            30
2)1235900                200           230
  -------                ----          ----
  6,17950              10000          6900
        4              -----          ----
  -------
   ,71800                 D              E
       40          -----------------------------
   ------          200      165       90
 28,72000           40       90       40
 --------         ----     -----     ----
                  8000     14850     130
                  ----     -----     100
                                    -----
                                    13000
                                    14850
                                     8000
                                    -----
                                    35850 DE
                                     6900 oF
                                    -----
                                    42750 Subtracted
                                    -----
```

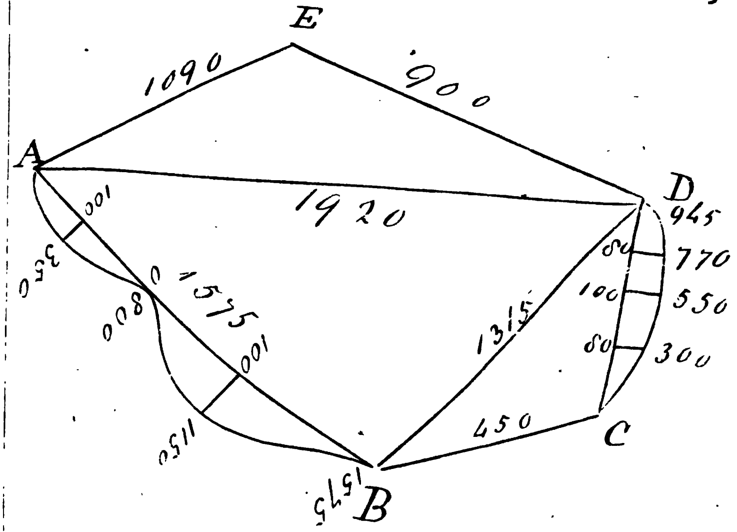
A B

45	190	30	30
220	40	40	100
900	7600	70	3000
90		90	6300
			9900
9900		6300	7600
			26800=AB

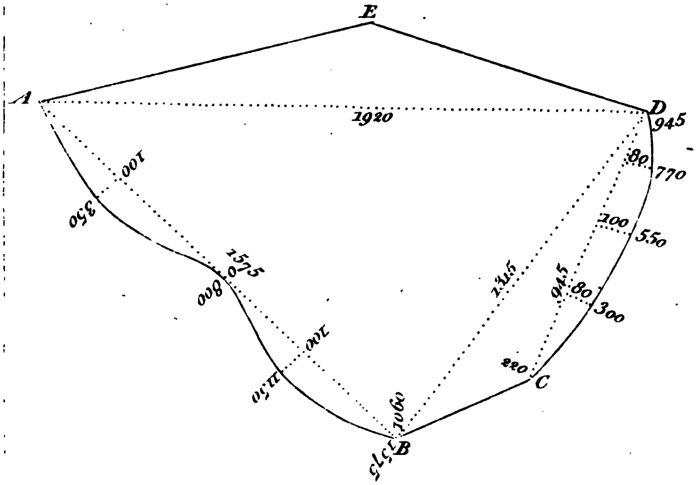
	A	R	P
Content	6	0	28

Draw a Plan, and find the Content of a Field, from the rough ſketch. Plate 4th.

Rough Sketch.



Plan.



Dix delin. London, Published as the Act directs, Oct.r [illegible] by L.B. Seeley & T. Dix Vincent sculp.

UNIV. OF MICH.

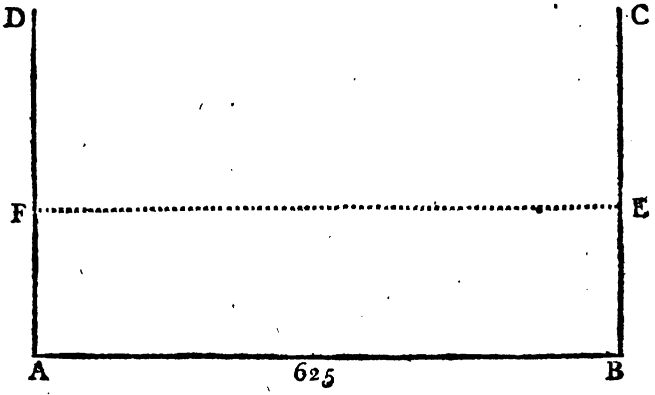
PART THE FIFTH.

RULES

To part off any given portion of a Field, in Form of a PARALLELOGRAM, TRIANGLE or SQUARE.

To part off a given portion of a Field, on a given line in form of a Parallelogram, when the Fences are at right angles.

Allow the given line AB to be 625 links long, what length muſt be taken on the lines AD and BC, that the Parallelogram ABEF may contain one acre, the two lines AD and BC, being at right angles to AB.



Rule—Reduce the given portion of land into links, and divide by the number of links in the given line, the quotient will be the length of the lines required.

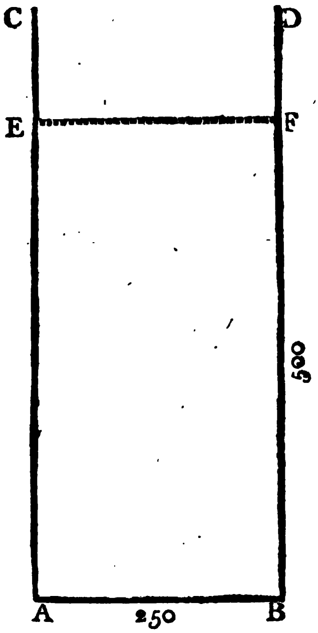
LINKS.

100000 in an Acre
50000 in $\frac{1}{2}$ an Acre
25000 in a Rood
625 in a Perch

625) 100000 (160 Length of BE and AF
625
———
3750
3750
———

Proof
625
160
———
1,00000
———

If the line AB is 250 links long; What length muſt be taken on the lines AC and BD, to part off an acre and a quarter in the form of a Parallelogram, AC and BD being at right angles to AB?

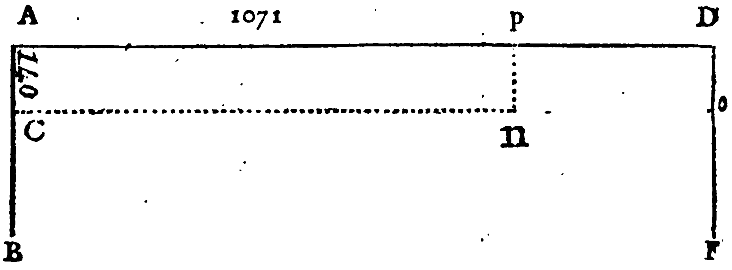


100000 Links in an Acre
25000 Ditto in ¼ an Acre

25,0) 12500,0 (500 Length of AE and BF
125

00

Allow the diſtance from A to C 140 links; What length muſt be taken on the line AD, to part off an acre and an half in the form of a Parallelogram, AC and AD being at right angles?



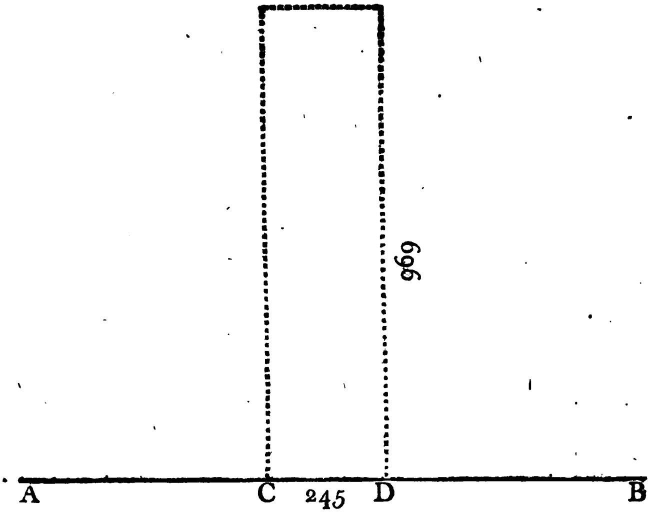
100000 Links in an Acre
50000 Links in ½ an Acre

14,0) 15000,0 (1071 Links Ans.
14
100
98
20
14
6

Note—To meaſure C n perpendicular to AB, place the croſs at C in ſuch a poſition, as to ſee the mark at B through one end of the groove, and the mark at A through the other end. Look through the other groove, and obſerve ſome mark in the fence DF which can then be ſeen, or place a mark at any convenient diſtance as at *o*, and meaſure the length required from C towards *o*, as C n.

In the ſame manner may the line p n be meaſured perpendicular to AD, or any other line to its baſe.

It is required to part off 2 *Acres* 1 *Rood* 20 *Poles, on part of the line* AB, *viz. from* C *to* D 245 *links long, in form of a right angled parallelogram.*



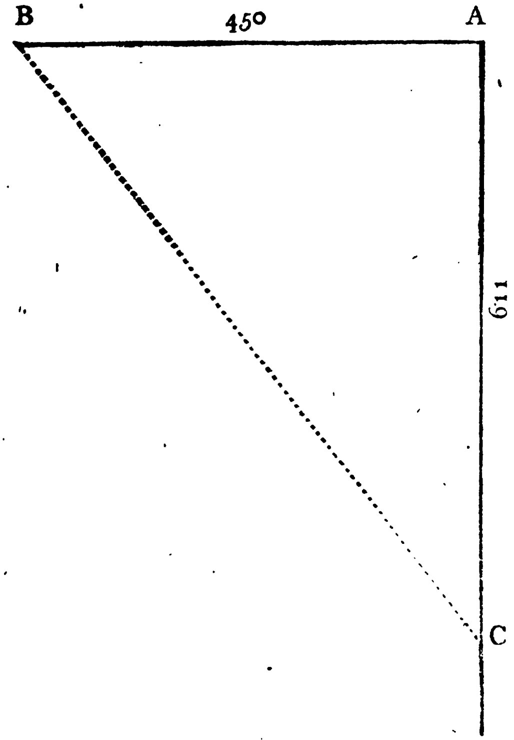
A R P
2 1 20 To be reduced to Links
4
9 Roods
40
380 Poles
625 Links in a Pole
50000
1875
245) 237500 (969 Ans.
2205
1700
1470
2300
2205
95

To part off any given portion of a Field on a given line in form of a triangle, when the fences are at right angles.

Rule. Reduce the quantity to links, and divide by half the given line, the quotient will be the length that muſt be taken on the adjoining line.

To theſe two draw a diagonal, which will complete the triangle required.

It is required to part off 1*A* 1*R* 20*P in form of a triangle, on the given line* AB, 450 *links in length; the two lines* AC *and* AB *being at right angles.*

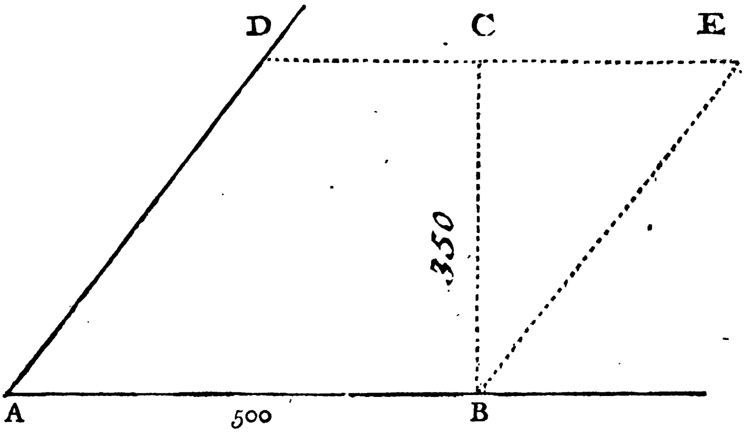


```
          A R  P
          1 1 20
          4
        ———
          5
          40
         ———
         220
         625
         ———
        12500
       1250
       —————
225)   137500 (611 Ans.
       1350
       —————
         250
         225
        ————
          250
          225
          ———
           25
          ———
```

To part off any given portion of a Field, in form of a parallelogram, when the fences are not at right angles.

Rule. Reduce the given quantity to links, which divide by the given line, the quotient will be the perpendicular height of a parallelogram, which will contain the given quantity.

It is required to part off a parallelogram which ſhall contain 1*A* 3*R on the baſe* AB 500 *links long; the lines* AB *and* AD *not being at right angles.*



A R
1 3
4

7
25000

5,00) 1750,00

350 Perpendicular height of the Parallelogram

Meaſure a perpendicular (BC 350) to the line AB, and leave a mark at C.

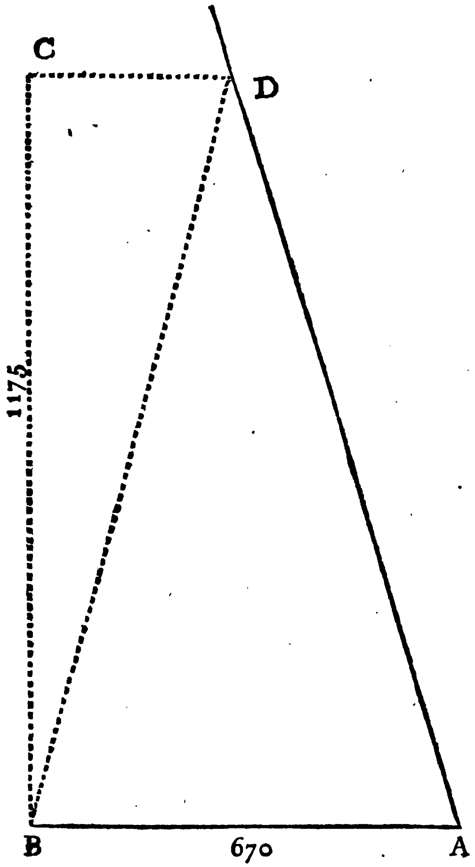
Meaſure a perpendicular (CD) to the line BC. Produce DC at C to E, till DE is equal to AB (500). The parallelogram ABED will contain the quantity required.

To part off a given portion of a Field in form of a triangle, when the fences are not at right angles.

Rule. Divide the given quantity in links by half the given line, the quotient will be the perpendicular height of a triangle, which will contain the portion required.

It is required to part off a triangle on the baſe AB 670, *that ſhall contain* 3*A* 3*R* 30*P*.

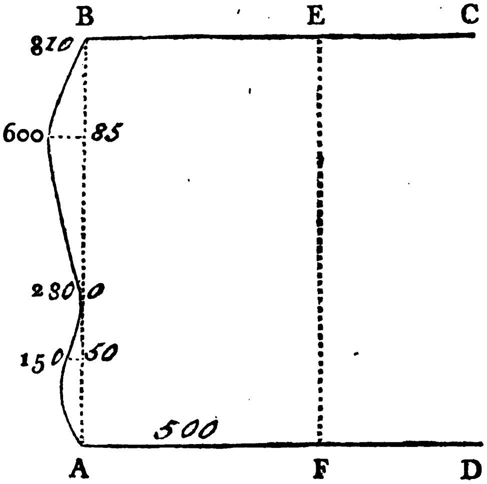
```
            A  R  P
            3  3  30
            4
          -----
            15
             40
          ------
            630
            625
          ------
          18750
         3750
         -------
335)  393750 (1175 Perpendicular height of
      335            the Triangle ABD
      -----
       587
       335
      -----
       2525
       2345
      -----
        1800
        1675
       -----
         125
       -----
```



If there are Offsets on a given line, and thoſe Offsets are to be included as part of the portion to be parted off.

Rule. Find the area of the offsets, which ſubtract from the given portion, proceed with the remainder as before.

It is required to part off 4 *Acres,* 1 *Rood,* 15 *Perches, in form of a parallelogram on the irregular line* AB *; the ſtraight line* AB *being at right angles to* BC *and* AD, *and* 810 *links long.*



280	530
50	85
14000	2650
45050	4240
2) 59050	45050
29525 Offsets to be ſubtracted	

A R P
4 1 16
4

17
40

696
625

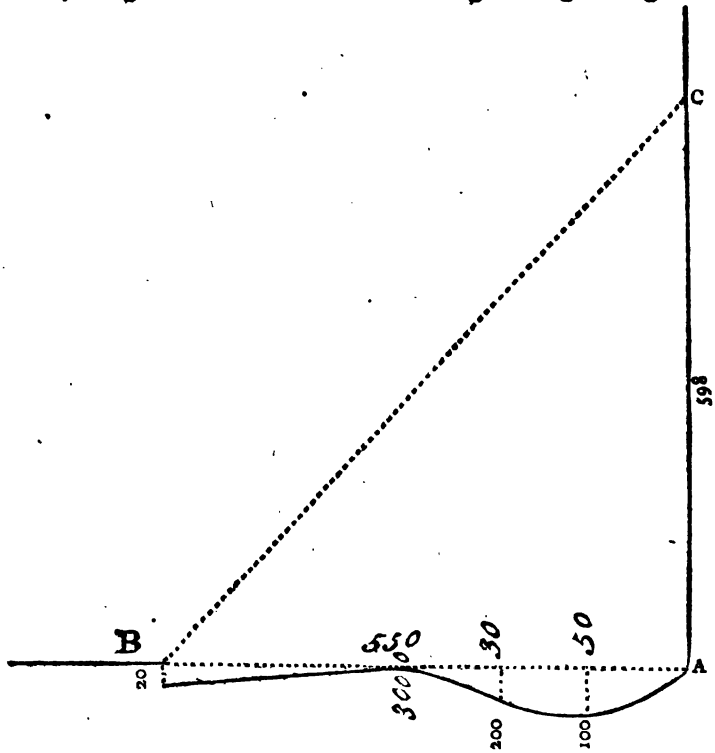
3480
1392
4176

435000
29525

81,0) 40547,5 (500=BE and AF
40500

47

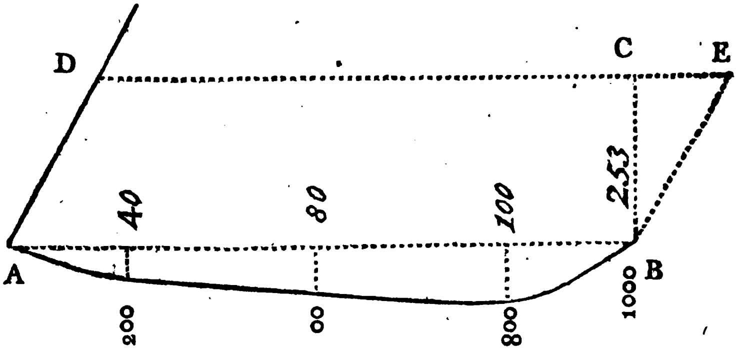
It is required to part off 1*A* 3*R on the irregular line* AB, 550 *links, long in form of a triangle; the two ſtraight lines* AB *and* AC *being at right angles.*



```
  100      50      30     250
   50      30     100      20
 ----    ----    ----    ----
 5000      80    3000    5000
 ----     100    ----    ----
         ----
         8000
         5000
         3000
         5000
        -----
    2)  21000
        -----
        10500 Offsets ſubtracted
        -----
```

```
          A R
          1 3
          4
        ----
          7
          25000
         ------
         175000
          10500
         ------
  275)   164500 (598=AC
         1375
         ------
          2700
          2475
          ----
           2250
           2200
           ----
             50
           ----
```

It is required to part off 3*A* 20P *in form of a parallelogram, on the irregular line* AB 1000 *links long; the ſtraight lines* AB *and* AD, *not being at right angles.*



40	40	80	100
200	80	100	200
8000	120	180	20000
	300	300	
	36000	54000	
		36000	
		8000	
		20000	
		2) 118000	
		59000 Offsets	

A R P
3 0 20
4

12
40

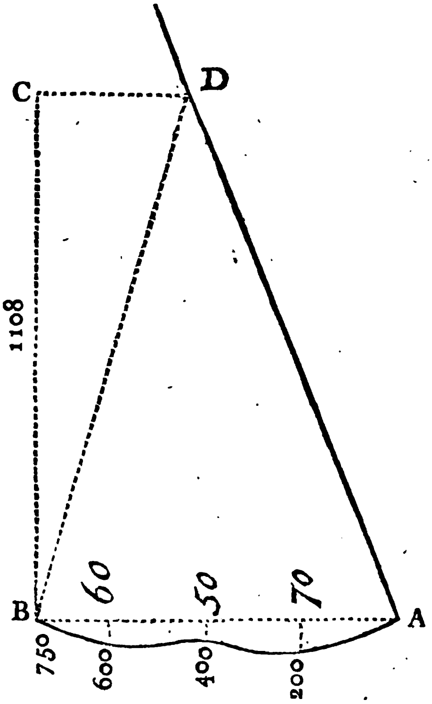
500
625

312500
59000

1,000) 253,500

253=BC

It is required to part off 4½ *Acres in form of a triangle on the irregular line* AB, 750 *links long; the ſtraight lines* AB *and* AD *not being at right angles.*



20	70	50	60
70	50	60	150
14000	120	110	9000
	200	200	
	24000	22000	

14000
22000
9000

2) 69000

34500

A R
4 2
4

18
25000

450000
34500

375) 415500 (1108=BC
375

405
375

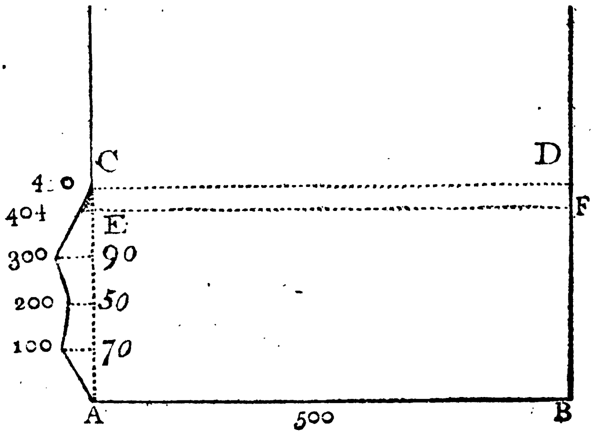
3000
3000

When the given line is ſtraight, but there are Offsets on an adjoining line, and thoſe Offsets are to be included as part of the portion to be parted off.

Rule for the following example of a parallelogram at right angles.

Reject the offsets, and the lines of partition will be CD and DB. The irregular figure ABCD will contain more than the quantity required by the offsets on the line AC, to rectify which, find the area of thoſe offsets in links, which divide by the number of links in the given line, the quotient will be the length in links, which muſt be taken back from C towards A as at E, and from D towards B as at F. ABEF will contain the quantity required leſs the ſhadowed offset.

What length muſt be taken on the lines AC *and* BD *to part off on the line* AB, 500 *links long*, 2*A* 1*R in form of a parallelogram; the ſtraight lines* BD *and* AC *being at right angles to* AB.



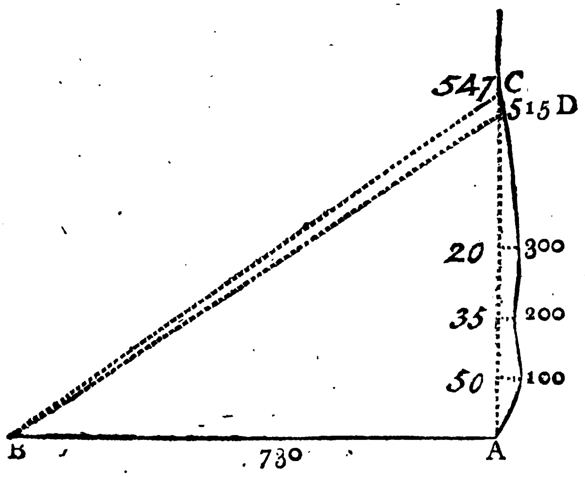
```
           A R
           2 1
           4
         -----
           9
          25000
         ------
 5,00) 2250,00
       -------
          450=AC        150
           46=CE         90         50
         -----         -----        90
 Ans.   406=AE         13500       -----
                      -------       140
 100       70                       100
  70       50                      -----
 -----    -----                    14000
 7000      120                      7000
 -----     100                     12000
          -----                    13500
          12000                    ------
         -------               2) 46500
                                   ------
                           5,00) 232,50
                                   ------
                                    46=CF.
                                  -----
```

Rule for the following example of a triangle at right angles.

Reject the offsets, and the line of partition will be BC. The irregular triangle ABC will contain more than the quantity required by the offsets on the line AC. To rectify which, find the area of thoſe offsets in links, which ſubtract from the given quantity, what remains muſt be divided by half the given line, the quotient will be the length that muſt be taken on the line AC as AD. The line of partition will be BD.

The irregular triangle ABD will contain the given quantity leſs the ſhadowed offset,

Allow the length of the given line AB *to be* 730, *what length muſt be taken on the line* AC, *that the irregular triangle* ABC *may contain* 2 *acres, the ſtraight lines* AB *and* AC *being at right angles.*



365) 200000 (547=AC
1825

1750
1460

2900
2555

345

50
100

5000

50
35

85
100

8500

35
20

55
100

5500
5000
8500
4940

2) 23940

11970
200000

365) 188030 (515=AD
1825

553
365

1880
1825

55

20
247

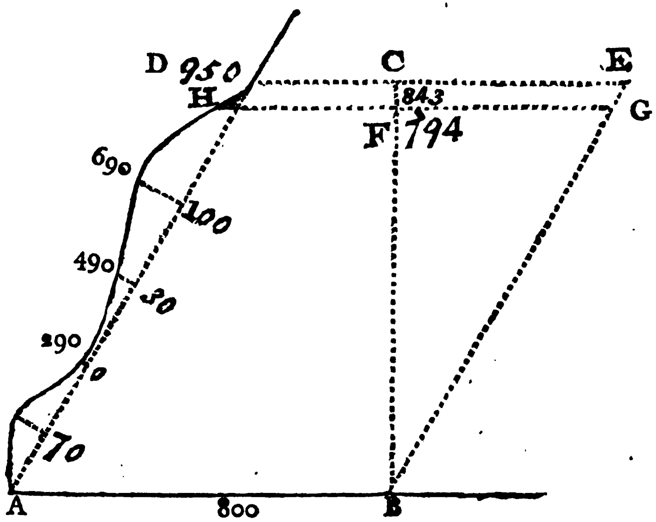
4940

Rule for the following example of a parallelogram not at right angles.

Reject the offsets, and the perpendicular height of the parallelogram will be BC, the portion parted off would then contain more than the quantity required by the offsets on the line AD. Find the area of thoſe offsets and ſubtract from the given quantity, divide the remainder by the given line, the quotient will be the perpendicular height BF, with which form the parallelogram as before, the portion ABGH will contain the quantity required leſs the ſhadowed offset.

It is required to part off 6*A* 3*R on the line* AB 800 *links long in form of a parallelogram*, AB *and* AD *not being at right angles.*

```
          A R
          6 3
          4
        ----
          27
          25000
        -------
         135000
         54
        -------
8,00)  6750,00
       -------
         843=BC
         ----
```



70	30	30	260
290	200	100	100
20300	6000	130	26000
		200	
		26000	
		6000	
		20300	
		26000	

2) 78300

39150 Subtracted

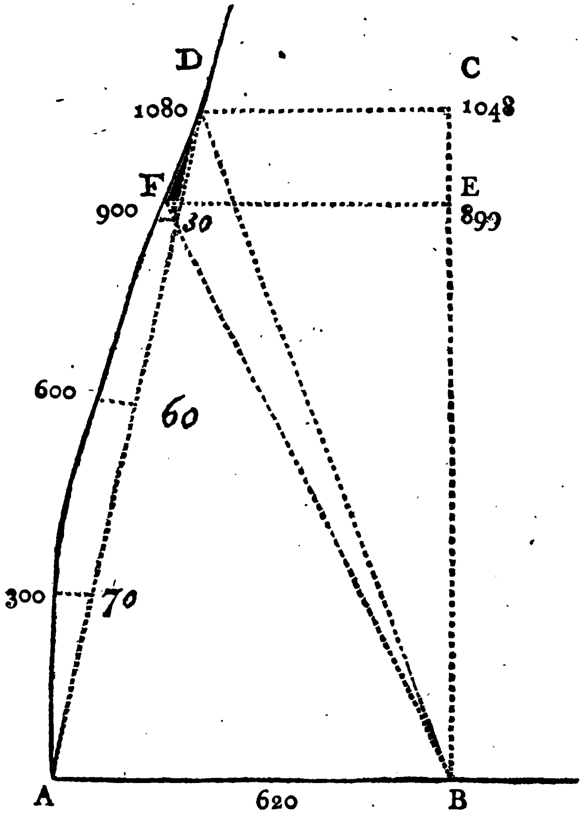
675000

8,00) 6358,50

794=BF

The following example of a triangle not at right angles, may be anſwered by the laſt rule, only obſerve to divide by half the given line.

It is required to part off 3¼ *acres on the line* AB, 620 *links long in form of a triangle, the fences not being at right angles.*



```
        A R
        3 1
        4
      ----
        13
        25000
        ------
31,0) 32500,0 (1048=BC
      31
      ----
       150
       124
       ----
        260
        248
        ----
         12
        ----
```

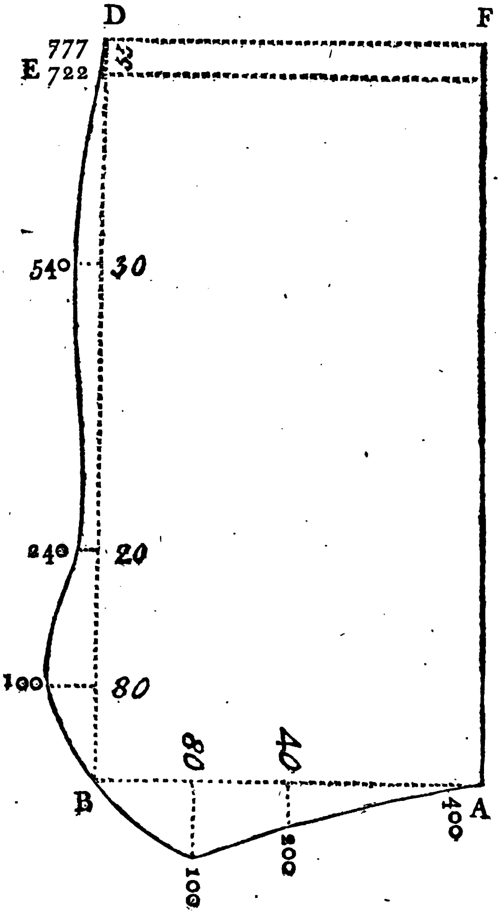
```
  70          70        60      30
 300          60        30     180
-----       -----     -----   -----
21000        130        90    5400
-----        300       300    -----
            -----     -----
            39000     27000
            21000     -----
            27000
             5400
            -----
         2) 92400
            -----
            46200 Subtracted
           325000
           ------
   31,0) 27880,0 (899=BE
         248
         ---
          308
          279
          ---
           290
           279
           ---
            11
           ---
```

When there are offsets on the given line, and on an adjoining line, or on two adjoining lines, and the offsets are to be included as part of the quantity to be parted off.

Rule. Let the area of the offsets which are on the given lines be ſubtracted from the given portion, and proceed with the remainder and the other offsets, as in the former examples.

Allow the length of the given line AB *to be* 400 *links long; what length must be taken on the lines* BD *and* AF *to part off* 3*A* 1*R in form of a right angled parallelogram?*

	A R	
80	3 1	40
100	4	80
8000	13	120
	25000	100
40	325000	12000
200	14000	8000
		8000
8000	4,00) 3110,00	
		2) 28000
	777=BD	
		14000


D
F
E 722
B
A

100	20	237
80	30	30
———	———	———
8000	50	7110
———	300	———
	———	
80	15000	777 BD
20	14000	55 ED
———	7110	———
100	8000	722=BE
140	———	———
———	2) 44110	
14000	———	
———	4,00) 220,55	
	———	
	55=ED	
	———	

It is required to part off 3*A* 3R 17*P in form of a parallelogram on the irregular line* AB; *the ſtraight lines* AD *and* BC *being at right angles.*

150	50	20	150
50	20	40	40
———	———	———	———
7500	70	60	6000
———	150	200	———
	———	———	
	10500	12000	
	12000	———	
	7500		
	6000		
	———		
	2) 63000		
	———		
	18000		
	———		

A	R	P
3	3	17

4

15

40

617

625

3085

1234

3702

385625

18000

65,0) 36762,5 (565=AD & BC

325

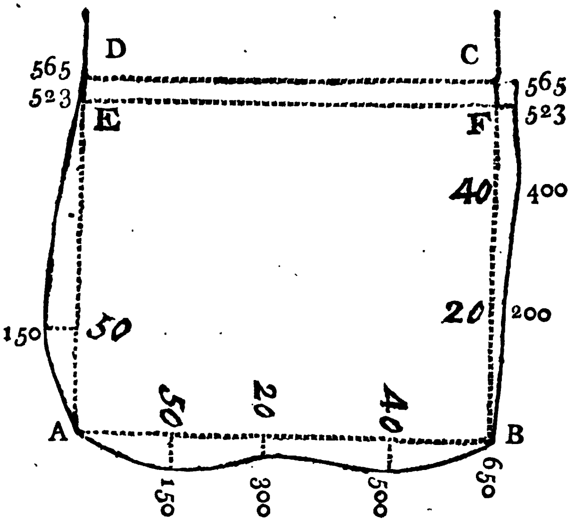
426

390

362

325

37



565
50
28250
4000
12000
11550
2) 55800
65,0) 2790,0 (42=ED & FC
260
190
130
60

200
20
4000

20
40
60
200
12000

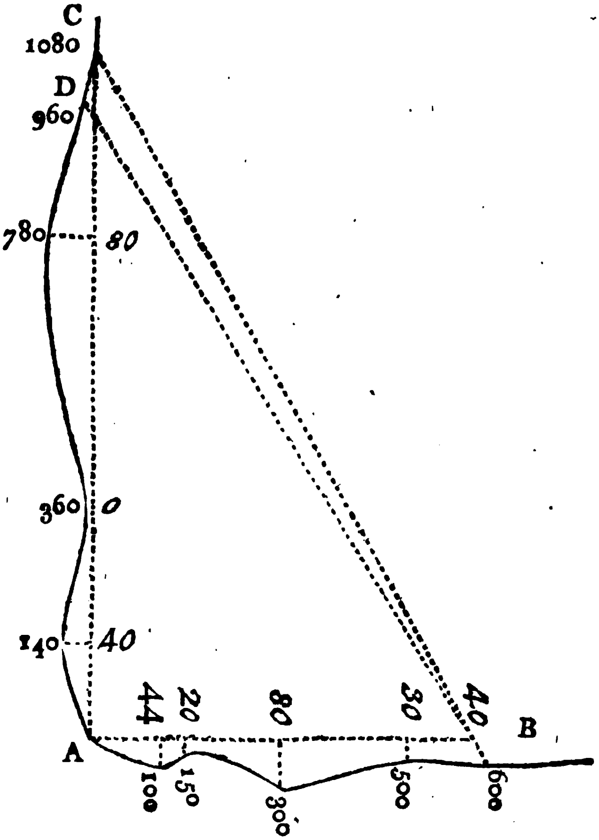
40
30
70
165
11550

565
42
523=AE & BF

Allow the length of the given line AB *to be* 600; *what length muſt be taken on the line* AC, *that the irregular triangle* ABC *may contain* 3 *Acres*, 2 *Roods? the ſtraight lines* AB*and* AC *being at right angles.*

```
 44        24          20        80      30
 100       40          80        30      40
 ----      ----        ----      ----    ----
 4400      64          100       110     70
 ----        50        150        200    100
           -----       -----     -----   ----
           3200        15000     22000   7000
           -----        4400     ------  ----
                        3200
                       22000
                        7000
                       -----
                    2) 51600
                       -----
                       25800
                       -----

                A  R
                3  2
                4
               ----
               14
               25000
              ------
              350000
               2580,0
              ------
       3,00)  3242,00 Firſt Remainder
              -------
              1080=AC
              ----
```



360
40

14400

80
720

57600
14400

2) 72000

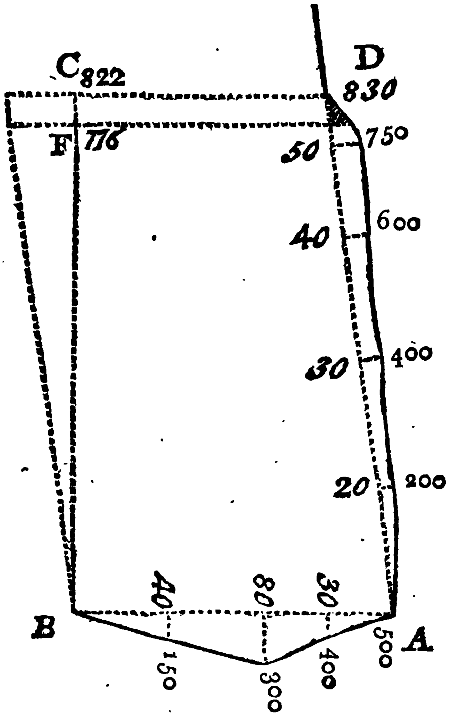
36000
324200 Firſt Remainder

3,00) 2882,00

960=AD

It is required to part off 4*A* 1*R* 8*P in form of a parallelogram on the irregular line* AB, 500 *links long; the ſtraight lines* AB *and* AD *not being at right angles.*

```
   40      40        80     30
  150      80        30    100
 ----    ----      ----   ----
 6000     120       110   3000
 ----     150       100   ----
         ----      ----
        18000     11000
       ------      6000
                  18000
                   3000
                 ------
               2) 38000
                 ------
                  19000
                 ------
```



A R P
4 1 8
4

17
40

688
625

3440
1376
4128

430000
19000

5,00) 4110,00 Firſt Remainder

822=BC

200	30	30	40	50
20	20	40	50	80
4000	50	70	90	4000
	200	200	150	
	10000	14000	13500	

4000
10000
13500
4000

2) 45500

22750
411000 Firſt Remainder

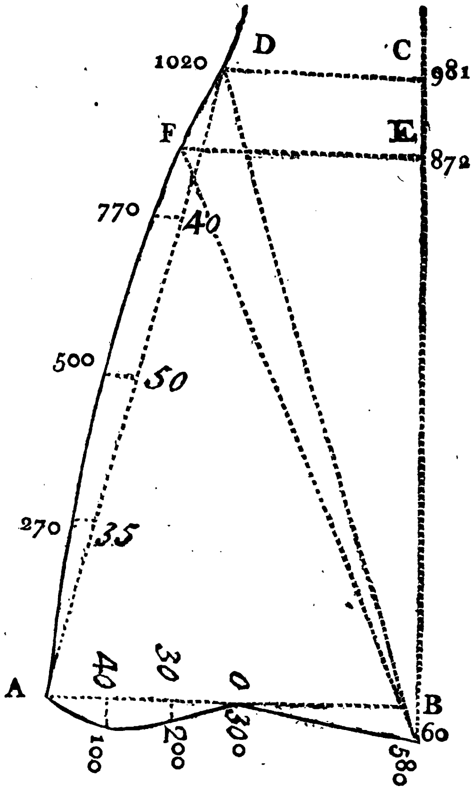
5,00) 3882,50

776=BF

It is required to part off 3 *acres in form of a triangle on the irregular line* AB 580 *links long ; the ſtraight lines* AB *and* AD *not being at right angles.*

```
   100        30        30       280
    40        40       100        60
  ----      ----      ----      -----
  4000        70      3000     16800
  ----       100      ----     -----
            ----
            7000
            4000
            3000
           16800
          ------
       2)  30800
          ------
           15400
          ------

          300000
           15400
          ------
  29,0) 28460,0 (981=BC
        261
        ----
         236
         232
         ---
          40
          29
          --
          11
          --
```



35
270
2450
70
9450

50
40
90
270
24300

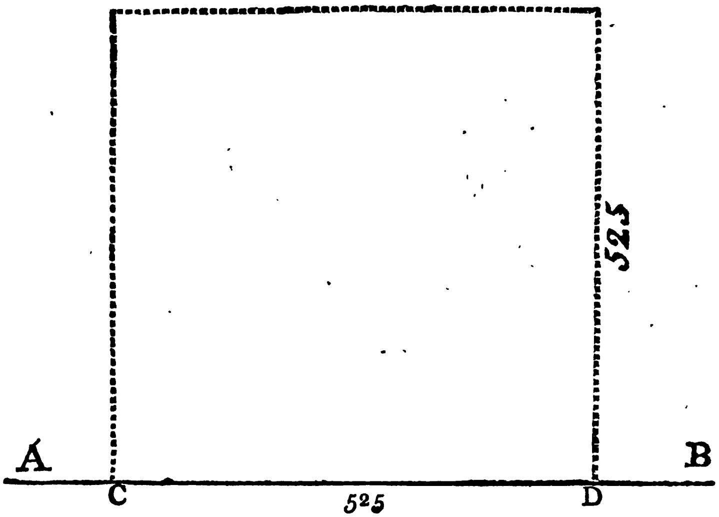
40
250
10000

```
            35
            50
          ----
            85
           230
          ----
          2550
         170
        ------
         19550
          9450
         24300
         10000
        ------
     2) 63300
        ------
         31650
        284600 First Remainder
        ------
29,0) 25295,0 (872=BE
      232
      ----
       209
       203
      ----
         65
         58
       ----
          7
       ----
```

To part off any portion of a Field in form of a ſquare.

Rule. Reduce the given quantity to links, and extract the ſquare root, which will be the length of a ſide of the ſquare required.

It is required to part off 2*A* 3*R* 1*P on the line* AB, *from* C *towards* B *in form of a ſquare.*



```
          A  R  P
          2  3  1
          4
        -----
         11
          40
        -----
         441
         625
        -----
        2205
        882
       2646
       ------
        .  .  .
       275625 (525=CD Ans.
       25
      ----
        256
   102\ 204
       ----
         5225
  1045\  5225
        -----
```

PART THE SIXTH.

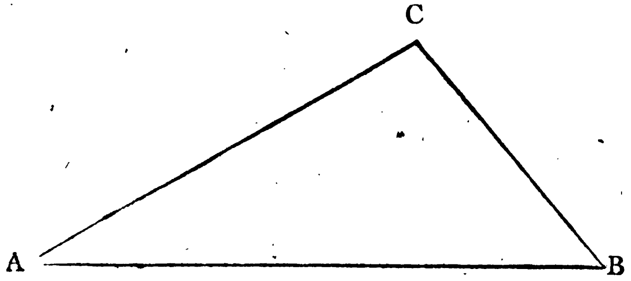
TO SURVEY SEVERAL FIELDS TOGETHER WITH THE CHAIN.

THE foregoing methods of ſurveying are beſt adapted for ſingle fields; but if ſeveral fields or a lordſhip is to be ſurveyed, the field-book muſt be kept in a different manner.

To render this method as eaſy to be underſtood as poſſible, I ſhall give examples of ſingle fields firſt, and then of ſeveral together.

The pages of the field-book muſt be ruled into three columns: it is beſt to begin taking notes at the bottom of the laſt page and write upwards.

To ſurvey the Triangular Field ABC.



Place three marks at the angles A, B and C, begin to meaſure at A towards B, allow the length of AB to be 1785. The notes in the field-book will ſtand thus:

Left of B
1785 AB
begin at A

Meaſure BC, allow its length to be 907, write this above the laſt notes thus:

Left of C
907 BC
L of B
1785 AB
begin at A

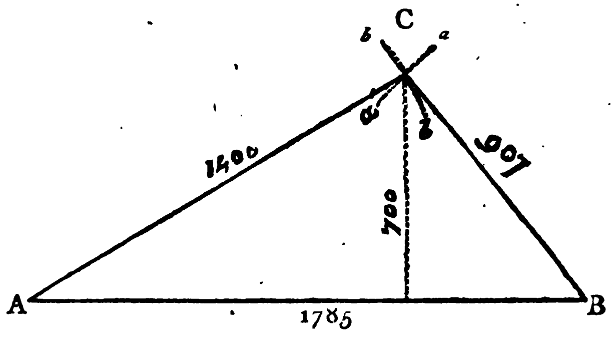
Meaſure the other line CA 1400, which write above the laſt notes thus:

End 1400 CA L of C
907 BC L of B
1785 AB begin at A

From the above notes, the plan and content of the Field may be obtained.

To construct the Plan.

Draw the line AB 1785.

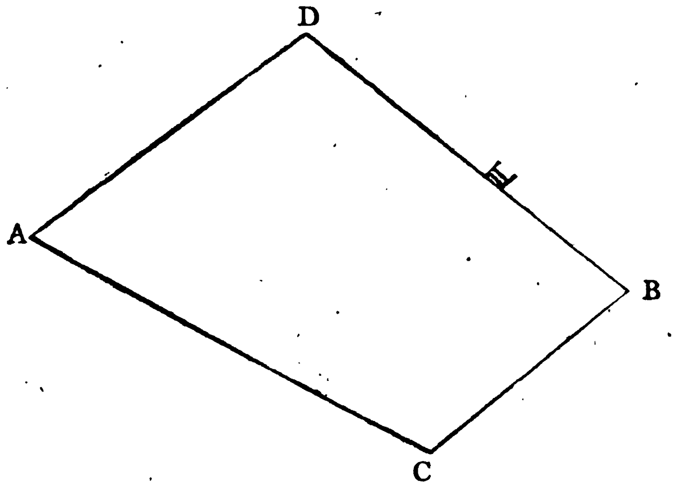


With the radius BC 907, and B as a centre, draw the arc *aa* on the left ſide of the line AB.

With the radius CA 1400, and A as a centre, draw the arc *bb*, ABC is the plan.

	A	R	P
The Content is	6	1	0

To ſurvey a Trapezium ACBD.

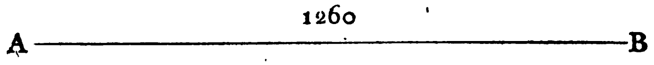


Meaſure the four ſides and the diagonal AB, in the ſame manner the three ſides of the triangle were meaſured, the notes will ſtand thus:

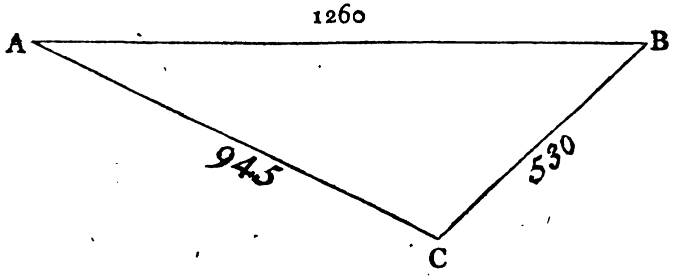
	865 DB
	470 Gate
	R^{t} of D
	745 AD
	R^{t} of A
	945 CA
	R^{t} of C
	530 BC
	R^{t} of B
Diagonal	1260 AB
Begin at	A

To construct the Plan.

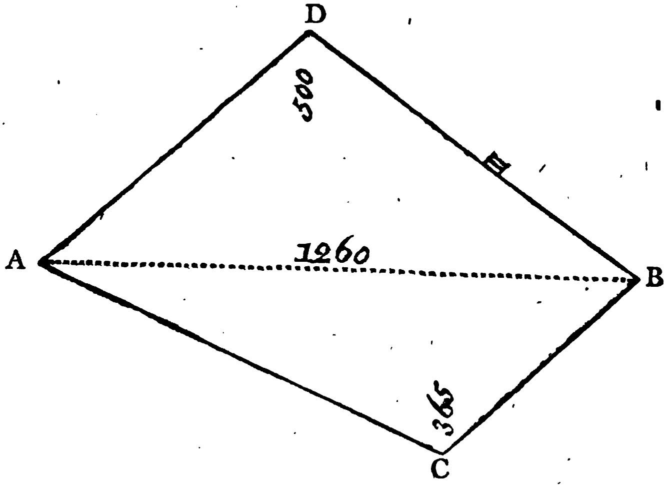
Draw the diagonal AB 1260.



On the right ſide of it complete the triangle ABC.

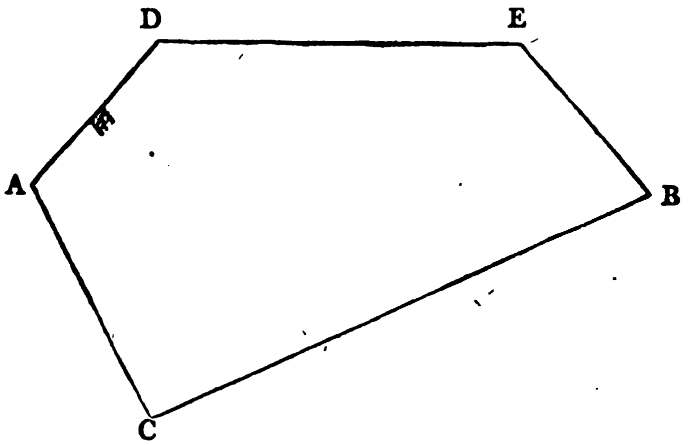


On the left ſide complete the triangle ADB.



	A	R	P
Content	5	1	31

To draw a plan, and find the content of a Field which has five ſides.

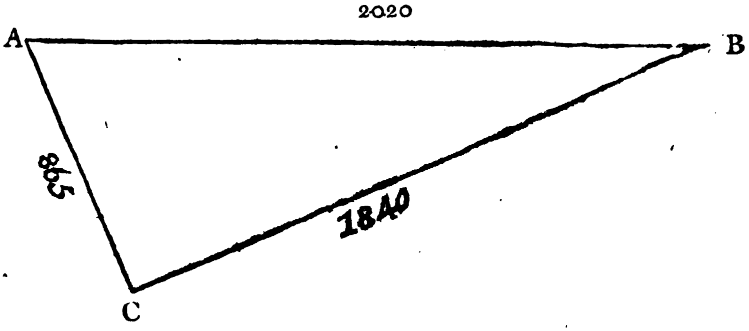


Meaſure the five ſides and the two diagonals, the notes in the field-book will ſtand thus:

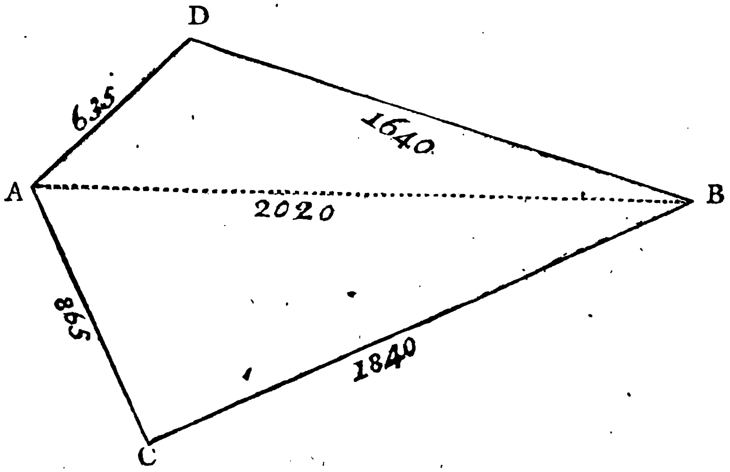
	End 1225 ED
	L of E
	555 BE
	L of B
Diagonal	1640 DB
	R^{t} of D
	635 AD
	300 Gate
	R^{t} of A
	865 CA
	R^{t} of C
	1840 BC
	R^{t} of B
Diagonal	2020 AB
Begin at	A

To DRAW THE PLAN.

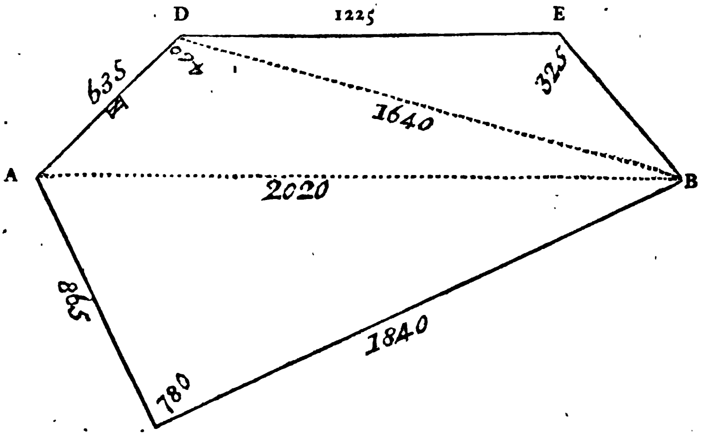
Conſtruct a triangle with the firſt three lines.



With AB for a baſe and the two following lines, conſtruct another triangle ABD.



With DB as a baſe and the remaining two ſides, conſtruct the third triangle DBE.

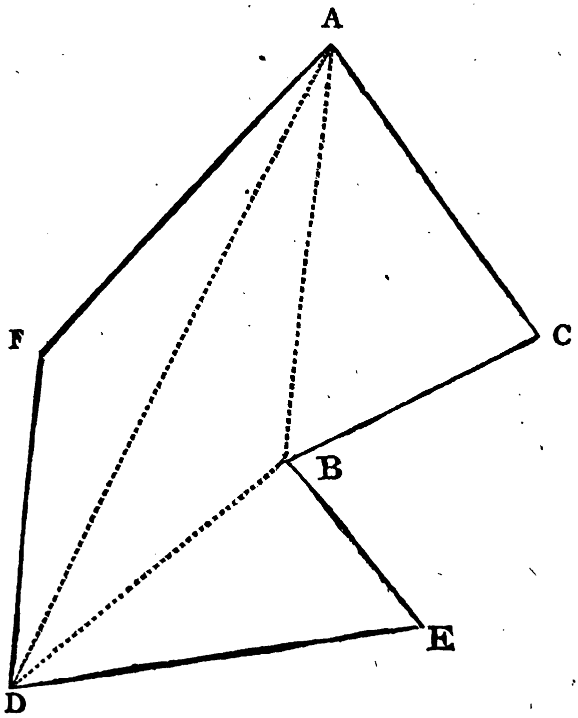


	A	R	P
Content	15	0	30

Draw a plan and find the content of a Field, from the following notes.

	875 FA R^t of F
	700 DF R^t of D
	860 ED R^t of E
	435 BE R^t of B
Diagonal	745 DB L of D
Diagonal	1495 AD L of A
	746 CA L of C
	600 BC L of B
Diagonal Begin at	868 AB A

PLAN.

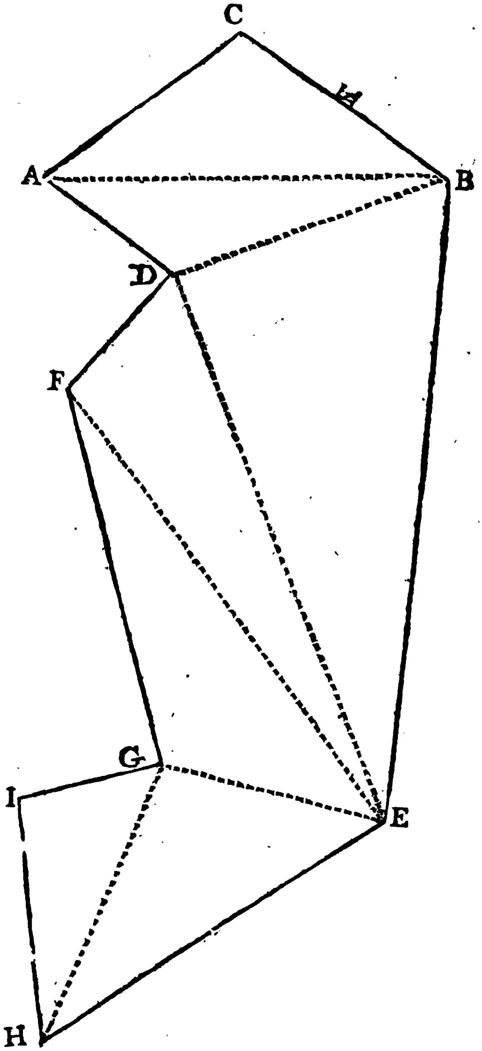


M

Draw a plan and find the content of a Field, from the following notes.

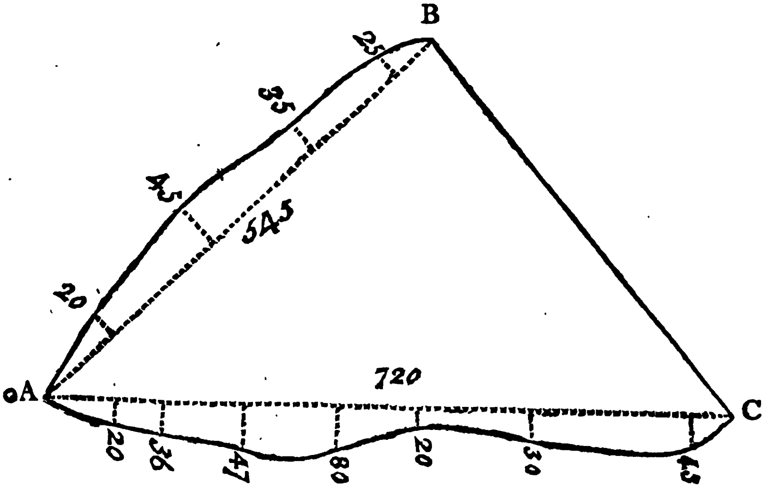
	445 IG R^{t} of I
	780 HI R^{t} of H
	1260 HE L of H
Diagonal	900 GH L of G
	1260 GF R^{t} of G
Diagonal	680 EG R^{t} of E
Diagonal	1670 FE L of F
	480 DF L of D
Diagonal	1825 ED R^{t} of E
	2000 BE 845 Gate R^{t} of B
Diagonal	890 DB L of D
	475 AD L of A
	760 CA L of C
	850 B L of B
Diagonal Begin at	1260 AB A

PLAN.



A R P
Content 25 0 32

In meaſuring a line which has offſets on the left ſide, note them down in the left column of the Field-book; if they are on the right ſide, note them in the right column.



In meaſuring from A to B the notes will ſtand thus:

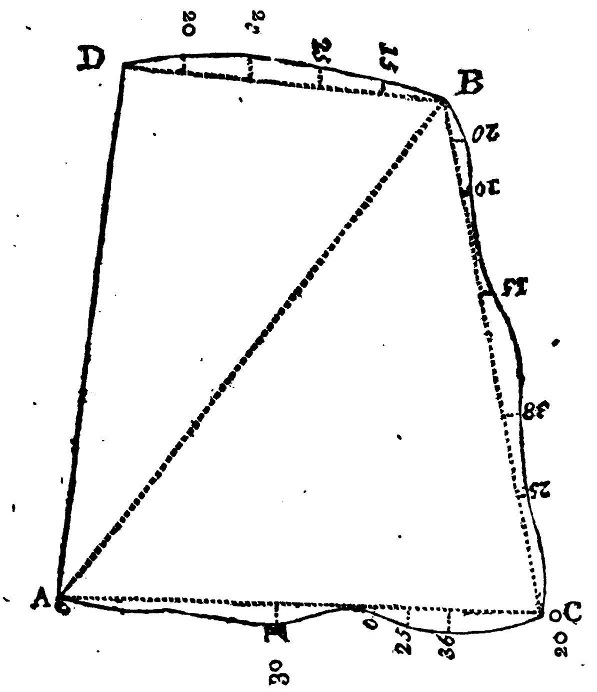
0	545 AB	
25	500	
35	380	
45	240	
20	100	
Begin at	A	

In meaſuring from A to C the notes will ſtand thus:

	720 AC	0
	670	45
	500	30
	380	20
	300	80
	200	47
	120	36
	70	20
Begin at	A	0

Draw a Plan, and find the area of a Field, from the following Notes.

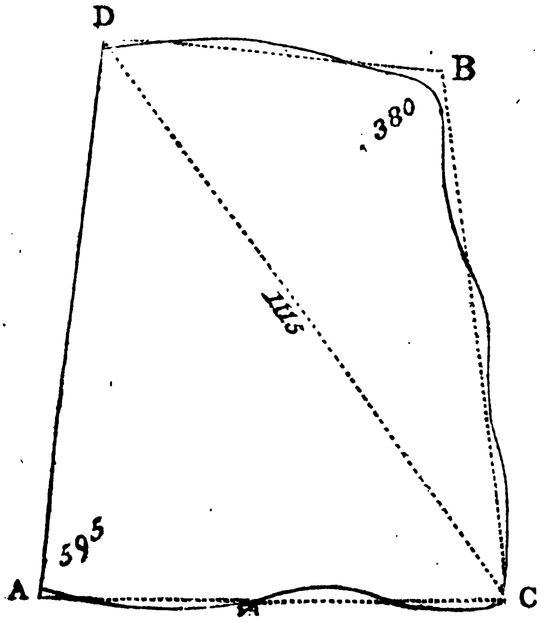
	500 DB	0
	400	15
	300	25
	200	25
	100	20
	R^{t} of D	0
	843 AD	
	R^{t} of A	
	745 CA	0
	405	30 Gate
	260	0
	200	25
	140	36
	R^{t} of C	20
	808 BC	0
	677	27
	500	15
	376	38
	300	15
	115	10
	55	20
	R^{t} of B	0
Diagonal	976 AB	
Begin at	A	



In ſurveying a Farm or Lordſhip conſiſting of ſeveral Fields, it is cuſtomary to draw a plan of the whole, and then compute the content of each piece ſeparately, by drawing freſh lines to divide them into Trapeziums and Triangles, the baſes and perpendiculars of which, muſt be accurately meaſured by the ſcale they were plotted from; in doing which, many of the crooked lines may be reduced to ſtraight ones, by applying a ſtraight piece of lantern-horn to the crooked line in ſuch a manner, that the ſmall parts cut off from the crooked figure by it, may be equal to thoſe which are taken in, which equality of parts included and excluded may be very nicely judged of by a little practice: then with a pencil draw a line by the ſtraight edge of the horn. Or inſtead of horn uſe a bow made of wire and cane, which can eaſily be applied with one hand, and two dots made with the other to draw a line by.

In this way the work is very expeditiouſly done and ſufficiently correct: for ſuch dimenſions are taken as afford the moſt eaſy method of calculation, and amongſt a number of parts thus taken and applied to a ſcale, it is likely ſome parts will be taken a ſmall matter too little, and others too great, ſo that they will upon the whole, in all probability, very nearly balance each other.—*Vide* HUTTON's Mathematical Dictionary, Vol. II. Page 553.

The following diagram repreſents the laſt Field with the fences ſtraightened, &c. according to the above method.



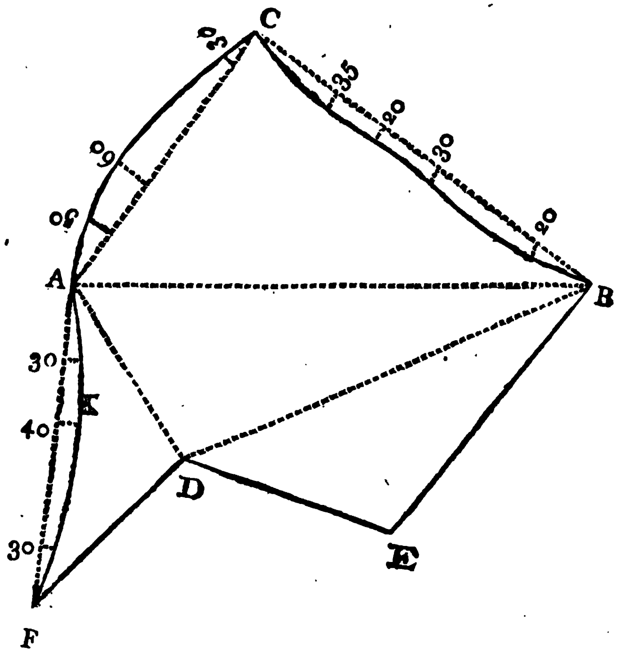
```
     595
     380
    ----
     975
    1115
    ----
    5575
   7805
 10035
 -------
2) 1087125
 -------
 5,43562
       4
 -------
 1,74248
      40
 -------
29,69920
 -------
```

	A	R	P
Content	5	1	29

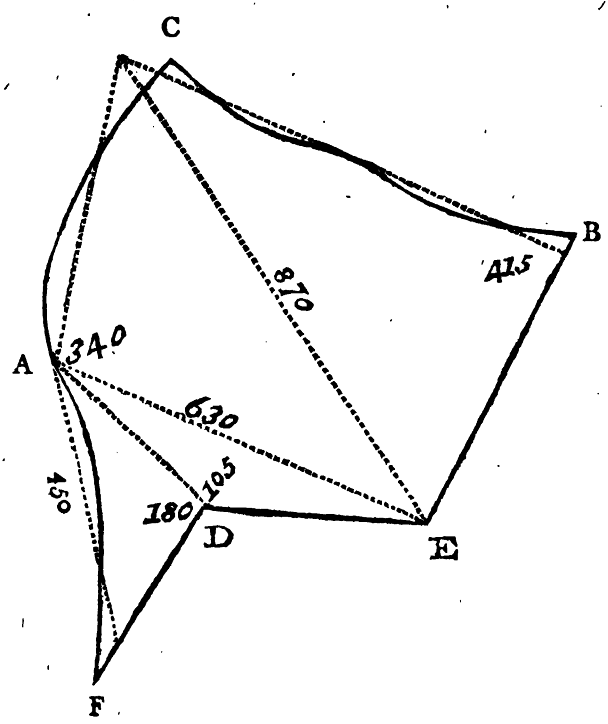
Draw a Plan, and find the area of a Field from the following Notes.

	500 FA	0
	400	30
	310	Gate
	300	40
	100	30
	Rt of F	0
	325 DF	
	L of D	
	345 ED	
	Rt of E	
	500 BE	
	Rt of B	
Diagonal	700 DB	
	L of D	
Diagonal	315 AD	
	L of A	
	505 CA	0
	400	50
	300	60
	60	30
	L of C	0
0	680 BC	
35	500	
20	410	
30	300	
20	100	
0	L of B	
Diagonal	825 AB	
Begin at	A	

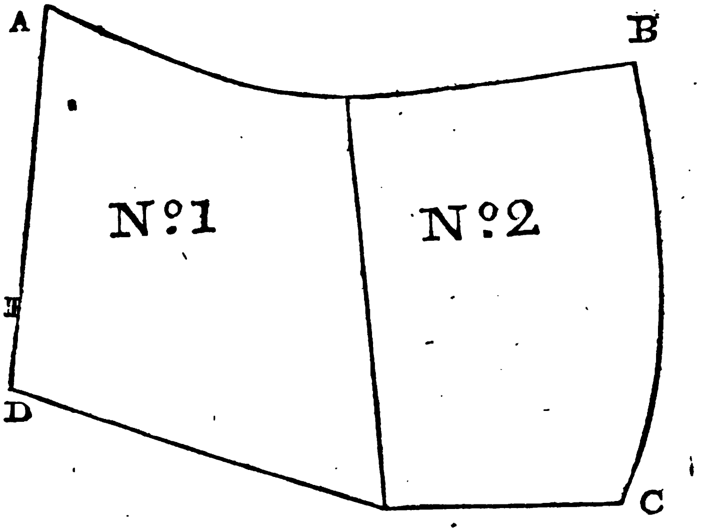
PLAN.



Plan with the crooked fences ſtraightened.



To ſurvey two adjoining Fields together.



Proceed as if they were one Field, in doing which, the fence which parts them will be croſſed three times. Note down in what part of the chain-line the croſſings are made, by drawing lines on that ſide the middle column the fence runs, or on both ſides if the fence runs on both ſides. This will be eaſily underſtood by examining the following notes, and comparing them with the plan.

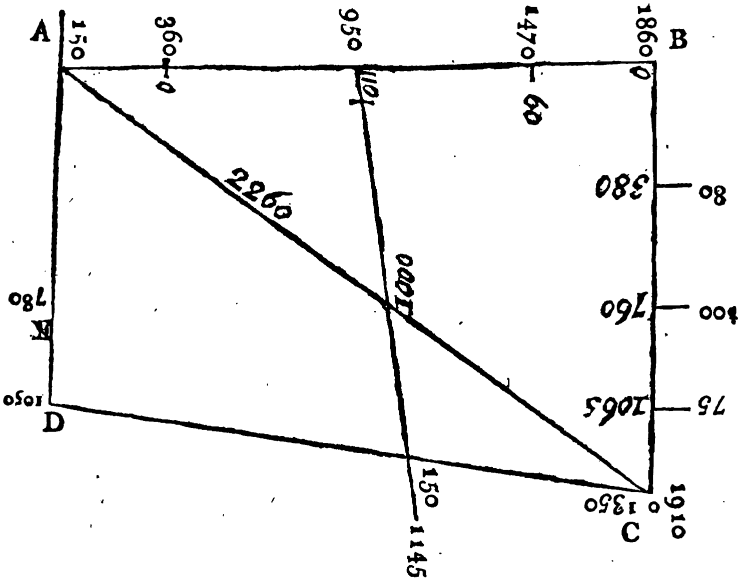
	1910 DC	0
——	1145	150
	L of D	
	1050 AD	
	780	Gate
	L of A	
Diagonal	2260 CA	
ſtraight ——	1000	—— ſtraight
	Rᵗ of C	
0	1350 BC	
75	1065	
100	760	
80	380	
	R of B	
	1860 AB	
	1470	60
	950	110 ſtraight
0	360	
150	A	Begin

To plot them.

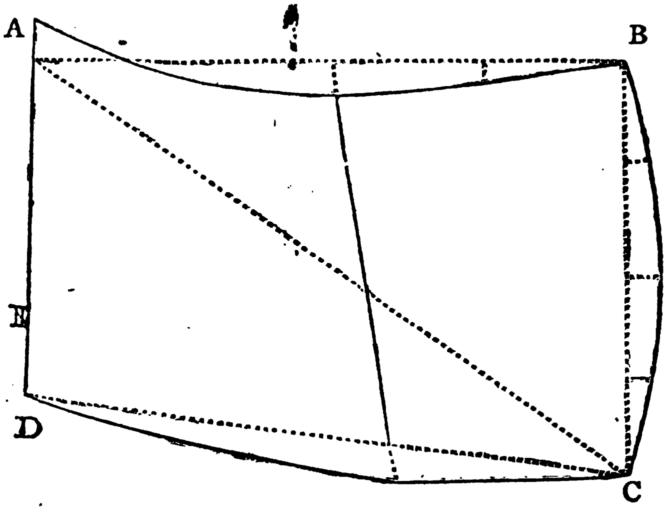
Draw the trapezium ABCD, and the offsets as before directed. Mark the place on the diagonal where you croſſed the fence, which ſtands thus in the Notes: ſtraight —— 1000 —— ſtraight.

The words *ſtraight*, denote the fence croſſed runs ſtraight to the end; and as it is croſſed in more than one place, there is no occaſion to meaſure it unleſs to prove the work.

The Plot will then appear thus:

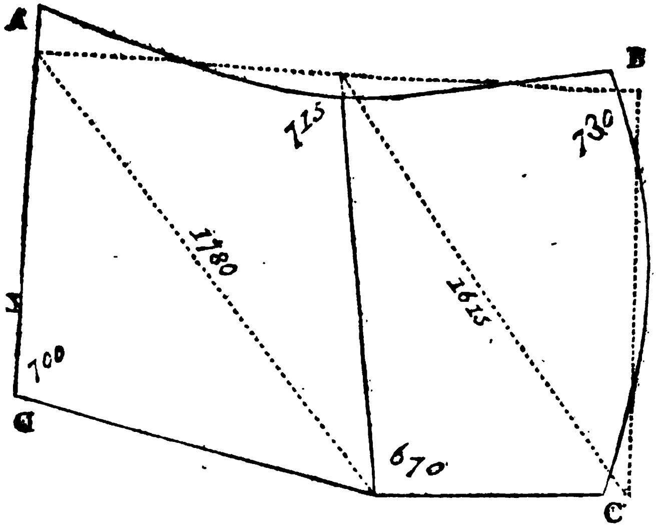


Draw the boundaries touching the extremities of the offsets, and it will appear thus:



Which being cleared of the ſuperfluous marks, &c. will be finiſhed as in the firſt figure.

Find the area of each Field ſeparately, by ſtraightening the fences, &c. as before directed.



	A	R	P
Content of N° 1.	11	1	34
Content of N° 2.	12	2	14

It muſt neceſſarily follow, the larger number of Fields there are, the greater will be the variety of memorandums and marks. It is impoſſible to invent a method that will ſuit all kind of Incloſures; but thoſe who ſtudy theſe notes, and carefully lay down the pieces from them, may gain ſuch a general knowledge of this method, as will enable them to ſurvey by it.

Moſt ſurveyors keep their Field-books in a ſimilar manner; but each adopts his own marks, nor do any two follow the ſame method exactly.

PROMISCUOUS DIRECTIONS.

BEFORE the learner attempts to ſurvey ſeveral Fields together, he ought carefully to examine the following notes, and lay down all the work from them.* When he does make the attempt, he muſt not burthen his memory with too many lines at firſt. After a little practice he may lay down the work twice a day, when more expert once a day will do. He muſt not be diſcouraged if his lines will not prove, ſmall variations will always occur with the moſt accurate, and a Tyro will very frequently have to meaſure his lines twice. He muſt not be in haſte to begin, but muſt walk over the tract of land two or three times, and obſerve how it can be divided into the largeſt triangles; for in all ſurveying with the chain, whether of ſingle or more Fields, or of a Pariſh, a chief point to be obſerved is, to meaſure the largeſt poſſible triangles which the caſe will admit. On the laying down of which triangle, the accuracy of almoſt every part muſt in a great degree depend.

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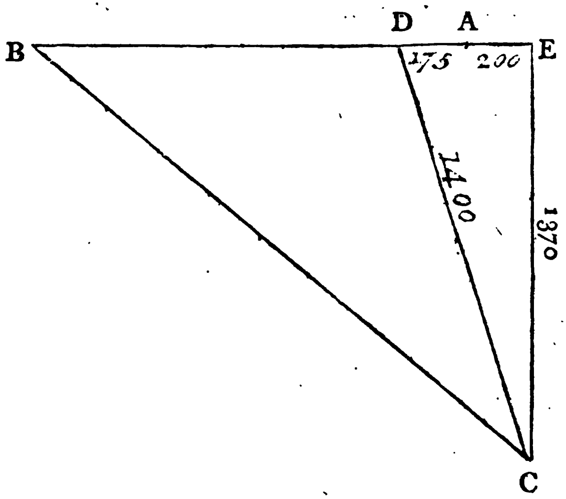
* To render this as eaſy as poſſible, the notes for the two following examples are engraved from the real Field-book, and ſtitched into covers by themſelves.

In meaſuring long lines, when the mark which is to be meaſured to cannot be ſeen, great care ſhould be taken to go in a ſtraight direction; to do which, the follower ſhould always have at leaſt three poles before him in a ſtraight line. So ſoon as he comes up to the neareſt, he muſt direct his aſſiſtant to get in a ſtraight line with the other two, and fix another beyond the laſt, proceeding in this manner till the line is finiſhed, which moſt likely will be either on the right or left of the mark meaſured for.

Or fix all the poles up firſt and then meaſure.

Suppoſe two lines of a triangle AB and BC are meaſured, and in meaſuring the third line it ends at D, meaſure the diſtance from D to A, the notes will ſtand thus:

	1400 CD L of C	175 to A



If the line ends at E, meaſure the diſtance from E to A, ſo that EB is one ſtraight line, the notes will ſtand thus:

200 to A ——	1370 CE L of C	

It is beſt to dig holes of different ſhapes for marks, in which poles may be placed, if a pole be removed by accident the hole will remain.

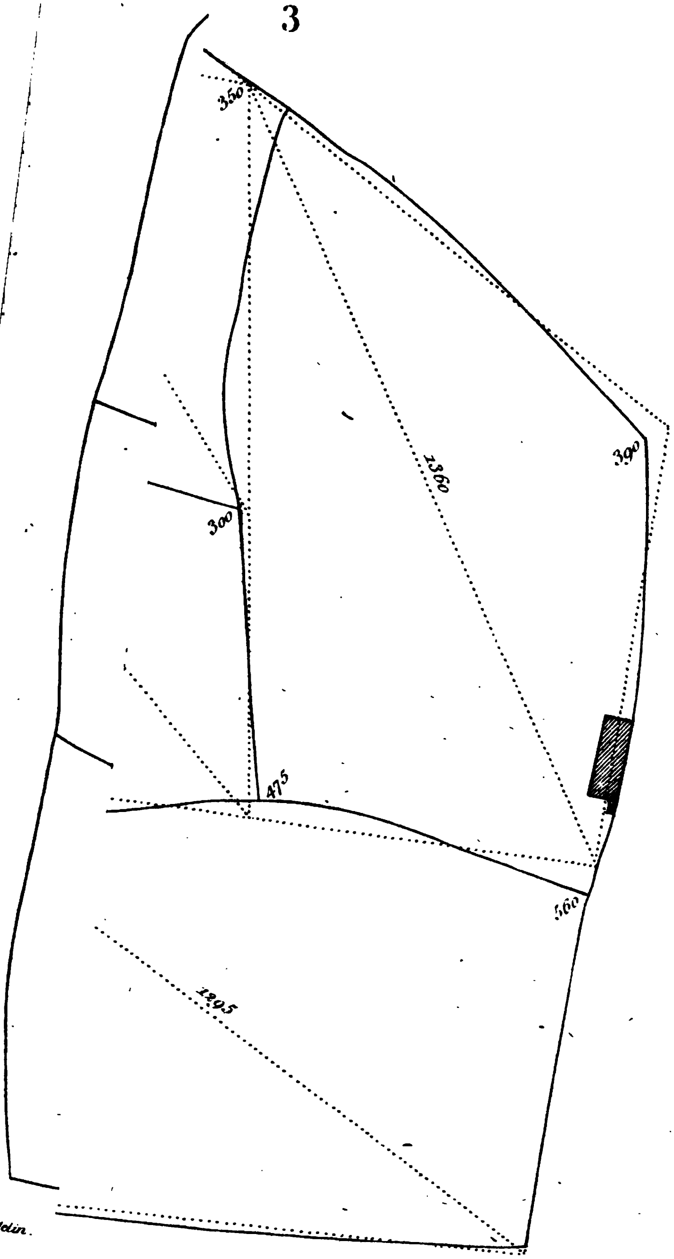
In taking ſmall ſurveys, the different marks are eaſily remembered, but if the lines are of a conſiderable length, the ſhape of the mark dug in the ground muſt be entered in the Field-book thus:
A△ B▵ C◁ D▽ E⊿ F∨ G□ H▭ I○ K◡ L⌓ M+ &c. &c.

No poles ſhould be left ſtanding but ſuch as ſerve for marks.

Many perplexing errors occur with young Surveyors, from changing the rods improperly. The leader muſt not aſk for the rods till he wants one to put down and has not got one; the leader and follower muſt then let the chain drop on the ground, meet each other half way, and each of them tell there are ten; the leader muſt then return to his place and put down a rod. It is beſt to note down every change thus: 1000, 2000, 3000, &c. if this is neglected, in meaſuring long lines an error of ten chains is very likely to happen.

If at any time a rod is loſt, return at once to the laſt mark and meaſure over again. By obſerving this rule much time will be ſaved, and many perplexing errors avoided.

3



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To ſurvey the four Fields together. Fig. 1ſt, Plate 5. The notes for which will ſtand thus:

	610 ID\	0
	500	30
	350	50
	250	40
	R^t of I	0
0	1120 FB	
50	840	
	620	0
	350	45
	L of F	
	1145 HG	
50	570	
40	400	—
⊙ I		
30	270	
0	R^t of H ⊙	
	200 CH ⊙	
Gate	100	
25	70	
	R^t of C ⊙	
Diagonal	1250 GC	
—	710	—
	L of G	

	1310 EG ⊙	
	1000	40
	855	40
	720	40
	700	Gate
	570	⊙ F 10
	380	0
	L of E ⊙	20
0	1080 EA ⊙	
35	700	
35	500	
35	270	
0	R^{t} of E	
Diagonal ⊙	2150 CE	
	1385	110
	1070	280
D ⊙ 180 85	835	ſtraight
	R^{t} of C	
	1865 AC	⊙
35	1415	
160	1230	ſtraight
60	990	
130 ⊙ B	700	
Gate 40	475	
50	350	
Begin at	A	

When the chain-lines, offsets, and other marks are drawn, the plan will appear as in Plate 5th. Fig. 2d.

Draw the boundaries touching the extremities of the offsets, clear it of ſuperfluous marks, and the plan will be finiſhed as in Fig. 1st. Plate 5th.

The area of each piece is computed by the rule in Page 167; Fig. 3d. ſhews the method of ſtraightening the crooked fences.

Content of No. 1.

A	R	P
3	2	21

Content of No. 2.

A	R	P
3	0	9

Content of No. 3.

A	R	P
5	3	21

Content of No. 4.

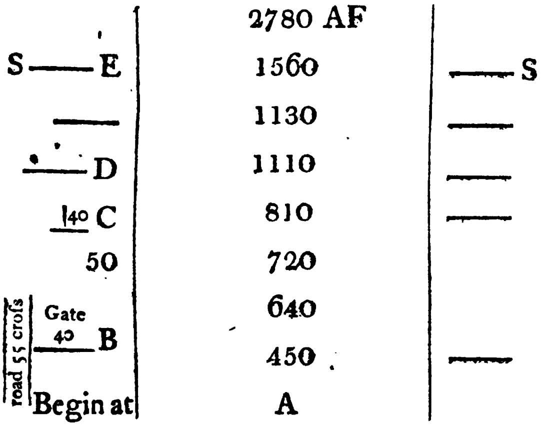
A	R	P
7	1	21

Directions for ſurveying and planning a ſmall Farm. Plate 6.

The dotted lines divide the whole into triangles, and are to be meaſured with the chain.

The notes for the largeſt triangle AFK will ſtand thus:

The firſt line AF.



The ſecond line FK.

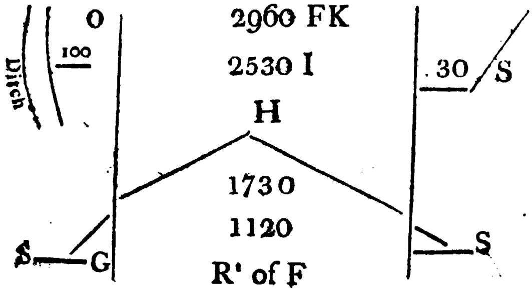
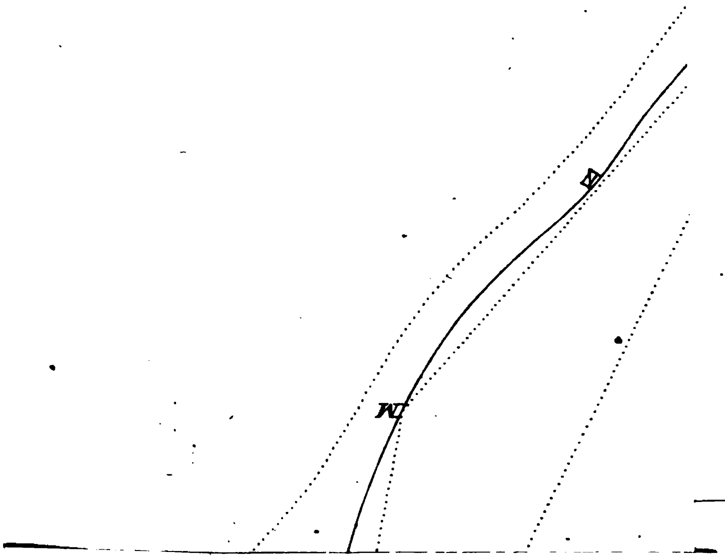


Plate VI.



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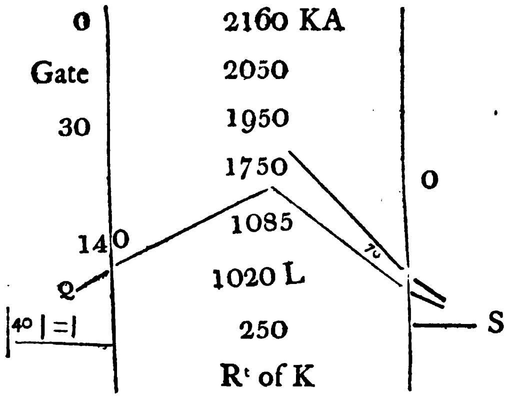
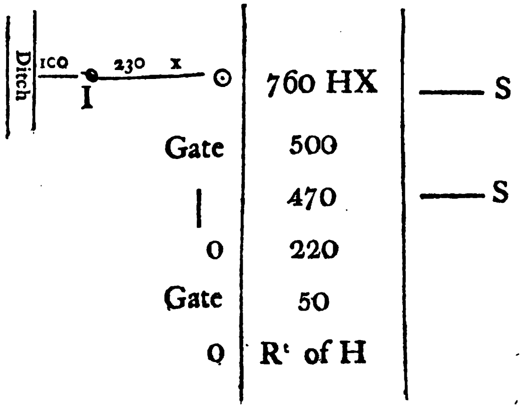
The third line KA.



Conſtruct the triangle with the three lines, draw the offsets and croſſings, it will appear as in Plate 7, Fig. 1. Next meaſure the lines within the triangle, viz. EG. MQ. QS. SM. RB. CT. VD. and HX. The other lines run ſtraight, and being croſſed in two places need not be meaſured unleſs to prove the work.

The notes for the above eight lines will ſtand thus:



10	600 VD	15
20	500	0
30	370	
20	250	0
—— 0	50	20 ——
	L of V	
——	690 CT	0 ——
	400	25
	Rt of C	0
0	860 RB	
20	550	
30	385	
—— 0	100	——
	L of R	
	1010 SM	
0	600	
—|40 V	460	
⊙ T	170	
	Rt of S	
0	720 QS	
—— 100	540	R
40	370	—— ſtraight
Gate 30	340	
——	210	
	Rt of Q	

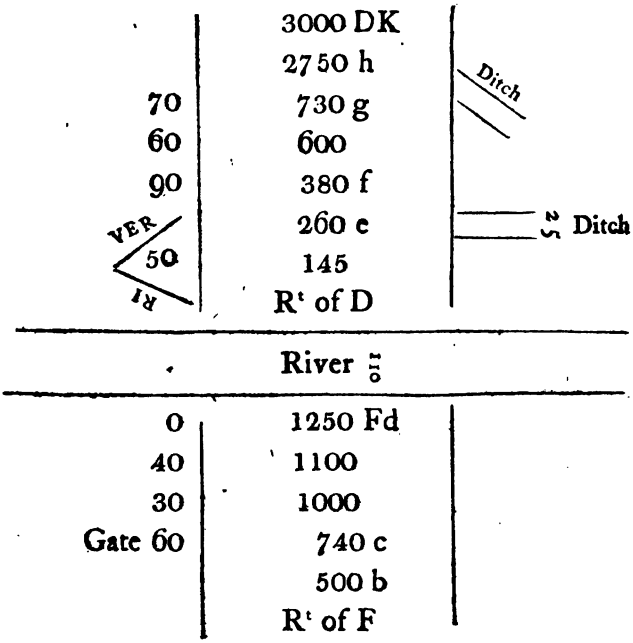
	1710 MQ	
	1580 ML	
S——⊙	1330	
S——N	1000	120
to H S	400	40
	Rt of M	0 Gate
	890 EG	
M	450	——
	Rt of E	

Then meaſure the two lines CW and WF.

0	1020 WF	
130	850	
0	450 Gate	
130	150	
0	Rt of W	
0	1030 CW	
60	670	——
50	320	——
45	290	Path
0	170	
Gate	100	
40	L of C	

When the foregoing lines are plotted, the offsets and croſſings marked, the plan will appear as in Plate 7, Fig. 2. Draw the boundary lines and it will appear as in Plate 7, Fig. 3. Then meaſure the two lines which will complete the next largeſt triangle Fd and DK.

The Notes will ſtand thus:



	3000 DK	
	2750 h	Ditch
70	730 g	
60	600	
90	380 f	
RIVER	260 e	25 Ditch
50	145	
	R^{t} of D	

River 10

0	1250 Fd	
40	1100	
30	1000	
Gate 60	740 c	
	500 b	
	R^{t} of F	

Meaſure the internal lines Hb, Kc, ek, ib, lf, and fi. Then the two ſmaller triangles g m h and h p n. The notes for which will ſtand thus:

	840 pn	40
	700	50
	440	0
	100	60
	L of p	
	615 hp	10
	400	0
	100	20
	L of h	
	1420 mh	
	70 n	
0	R^t of m	
0	900 gm	
40	765	
50	525	
0	300	
70	L of g	
	520 fi	
	R^t of f	
	300 lf	
30	240	
10	120	
50	50	
0	R^t of L	
0	300 il	
10	150	
0	R^t of i	

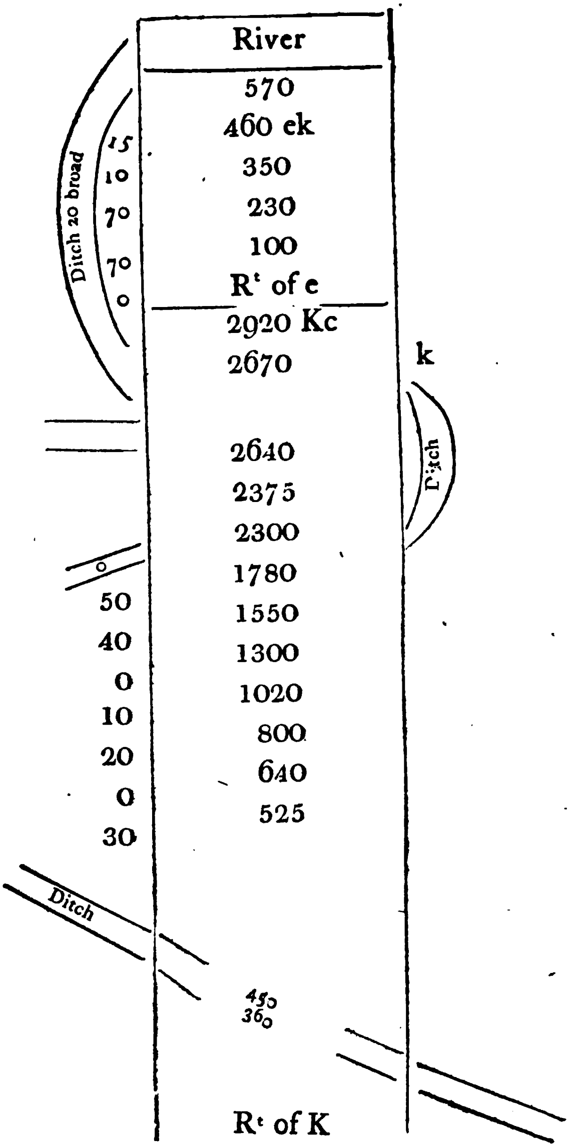
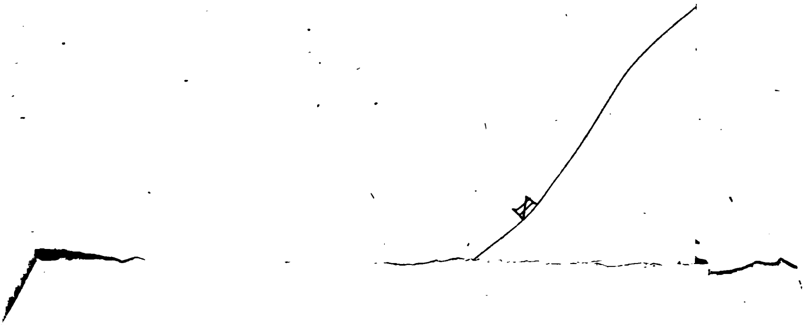

River
460 ek
R^{t} of e
Ditch 20 broad
2920 Kc
k
Ditch
1780
1550
Ditch
R^{t} of K

Plate VIII.



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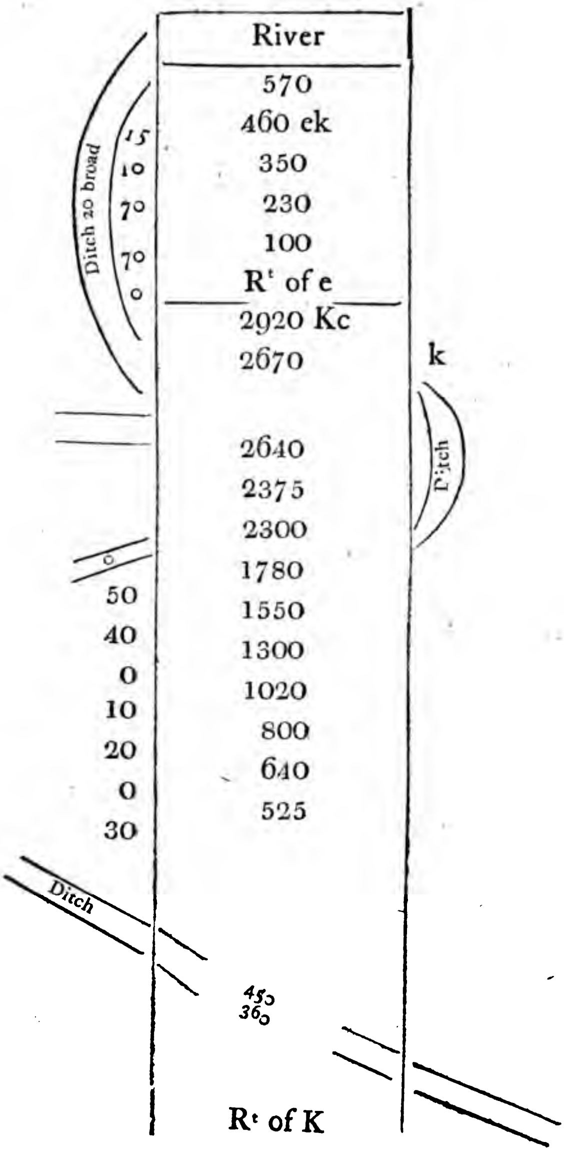
River
460 ek
Rt of e
2920 Kc
1780
1550
Rt of K
Ditch 20 broad
k
Ditch
Ditch

Plate VIII.

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